DRAFT EIR

FOR THE

MOSSDALE LANDING WEST SPECIFIC PLAN

JANUARY 2025

Prepared for:

City of Lathrop, Community Development Department
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7260

Prepared by:

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, CA 95762
(916) 580-9818

De Novo Planning Group

A Land Use Planning, Design, and Environmental Firm

DRAFT EIR

FOR THE

MOSSDALE LANDING WEST SPECIFIC PLAN

JANUARY 2025

Prepared for:

City of Lathrop, Community Development Department
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7260

Prepared by:

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, CA 95762
(916) 580-9818

Chapters	Page Numbers

Tables **Page Numbers**

Figures **Page Numbers**

Note: Figures are located at the end of the chapters.

Appendices

This page left intentionally blank.

INTRODUCTION

The City of Lathrop has determined that the Mossdale Landing West Specific Plan is a "Project" within the definition of CEQA. CEQA requires the preparation of an environmental impact report (EIR) prior to approving any project that may have a significant impact on the environment. For the purposes of CEQA, the term "Project" refers to the whole of an action, which has the potential for resulting in a direct physical change or a reasonably foreseeable indirect physical change in the environment (CEQA Guidelines Section 15378[a]).

The EIR contains a description of the Project, description of the environmental setting, identification of Project impacts, and mitigation measures for impacts found to be significant, as well as an analysis of Project alternatives, identification of significant irreversible environmental changes, growth-inducing impacts, and cumulative impacts. This EIR identifies issues determined to have no impact or a less than significant impact, and provides detailed analysis of potentially significant and significant impacts. Comments received in response to the Notice of Preparation (NOP) were considered in preparing the analysis in this EIR.

PROJECT DESCRIPTION

The Project site includes two distinct planning boundaries defined below. The following terms are used throughout this Draft EIR to describe the planning boundaries within the Project site:

- **Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site)** – totals 225.86 acres and includes the whole of the Project, including the proposed 167.42-acre Development Area, and land along the San Joaquin River (which would not be developed as part of the proposed Project).
- **Development Area** – includes 167.42 acres that is intended for development.

The majority of the Plan Area is currently undeveloped. There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures. Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

The Mossdale Landing West Specific Plan would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements over five phases. The Mossdale Landing West Specific Plan is based upon the Mossdale Village plan and policies presented in the West Lathrop Specific Plan (WLSP), which is consistent with the City of Lathrop's General Plan.

See Chapter 2.0 for a complete Project Description.

AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

This Draft EIR addresses environmental impacts associated with the proposed Project that are known to the City of Lathrop, were raised during the NOP process, or raised during preparation of the Draft EIR. This Draft EIR discusses potentially significant impacts associated with aesthetics, agricultural resources, air quality, biological resources, cultural and tribal resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use, population and housing, noise, public services and recreation, transportation and circulation, and utilities.

The City of Lathrop received nine written comment letters on the NOP for the proposed Project. A copy of the letters is provided in Appendix A of this Draft EIR. The commenting agency/citizen is provided below.

- California Department of Conservation (April 17, 2024);
- California Department of Transportation (April 22, 2024);
- Central Valley Regional Water Quality Control Board (April 22, 2024);
- Native American Heritage Commission (March 25, 2024);
- Pacific Gas and Electric Company (March 27, 2024);
- Pacific Gas and Electric Company (May 8, 2024);
- San Joaquin Council of Governments, Inc. (March 27, 2024);
- San Joaquin County Environmental Health Department (April 8, 2024); and
- San Joaquin Valley Air Pollution Control District (April 24, 2024).

ALTERNATIVES TO THE PROPOSED PROJECT

The CEQA Guidelines require an EIR to describe a reasonable range of alternatives to the Project or to the location of the Project which would reduce or avoid any of the significant impacts of the Project, and which could feasibly accomplish most of the basic objectives of the proposed Project. Three alternatives to the proposed Project were developed based on input from City staff, and the technical analysis performed to identify the environmental effects of the proposed Project. The alternatives analyzed in this EIR include the following three alternatives in addition to the proposed Project.

- **No Project (No Build) Alternative**: Under this alternative, development of the Plan Area would not occur, and the Plan Area would remain in its current existing condition.
- **Increased Density Alternative:** Under this alternative, the proposed Project would be developed with the same amenities as described in the Project Description, but the density of the residential uses would be increased, and the total development footprint would be equal to the proposed Specific Plan.
- **Lower Density Alternative:** Under this alternative, the proposed Project would be developed in such a way to promote larger lot sizes and to reduce the overall footprint of the developed areas.

Alternatives are described in detail in Chapter 5.

Table ES-1 presents a comparison of the impacts from the proposed Project relative to the Alternatives. As shown in the table, the No Project (No Build) Alternative is the environmentally superior alternative. However, as required by CEQA, when the No Project (No Build) Alternative is the environmentally superior alternative, the environmentally superior alternative among the others must be identified. The Increased Density Alternative would reduce impacts related to 25 impact statements, increase impacts related to one impact statement, and equal impacts related to 40 impact statements. The Lower Density Alternative would reduce impacts related to 31 impact statements and would have equal impacts related to 36 impact statements. Therefore, the Lower Density Alternative would be the next environmentally superior alternative.

TABLE ES-1: COMPARISON SUMMARY OF ALTERNATIVES TO THE PROPOSED PROJECT

Environmental Topic	*Proposed Project*	*No Project (No Build) Alternative*	*Increased Density Alternative*	*Lower Density Alternative*
Section 3.1 - Aesthetics (AES)				
AES Impact 3.1-1	LS	Less	Equal	Equal
AES Impact 3.1-2	LS	Less	Less	Equal
AES Impact 3.1-3	LS	Less	Less	Equal
AES Impact 3.1-4	LS	Less	Less	Equal
Section 3.2 – Agricultural Resources (AG)				
AG Impact 3.2-1	SU	Less	Equal	Equal
AG Impact 3.2-2	SU	Less	Equal	Equal
AG Impact 3.2-3	LS	Less	Equal	Equal
Section 3.3 - Air Quality (AQ)				
AQ Impact 3.3-1	LS	Less	Less	Less
AQ Impact 3.3-2	LS	Less	Less	Less
AQ Impact 3.3-3	LS	Less	Equal	Equal
AQ Impact 3.3-4	LS	Less	Less	Less
AQ Impact 3.3-5	LS	Less	Equal	Equal
Section 3.4 - Biological Resources (BIO)				
BIO Impact 3.4-1	LS/MM	Less	Less	Equal
BIO Impact 3.4-2	LS/MM	Less	Less	Equal
BIO Impact 3.4-3	LS/MM	Less	Less	Equal
BIO Impact 3.4-4	LS/MM	Less	Less	Equal
BIO Impact 3.4-5	LS	Less	Less	Equal
BIO Impact 3.4-6	LS	Less	Less	Equal
BIO Impact 3.4-7	NI	Less	Equal	Equal
BIO Impact 3.4-8	NI	Less	Equal	Equal
BIO Impact 3.4-9	LS	Less	Equal	Equal
BIO Impact 3.4-10	LS/MM	Less	Less	Equal
BIO Impact 3.4-11	LS/MM	Less	Less	Equal
Section 3.5 - Cultural and Tribal Resources (CLT)				
CLT Impact 3.5-1	LS/MM	Less	Equal	Equal
CLT Impact 3.5-2	LS/MM	Less	Equal	Equal
CLT Impact 3.5-3	LS	Less	Equal	Equal
CLT Impact 3.5-4	LS/MM	Less	Equal	Equal

ENVIRONMENTAL TOPIC	PROPOSED PROJECT	NO PROJECT (NO BUILD) ALTERNATIVE	INCREASED DENSITY ALTERNATIVE	LOWER DENSITY ALTERNATIVE
SECTION 3.6 - GEOLOGY AND SOILS (GEO)				
GEO Impact 3.6-1	LS	Less	Equal	Less
GEO Impact 3.6-2	LS	Less	Equal	Less
GEO Impact 3.6-3	LS	Less	Equal	Less
GEO Impact 3.6-4	LS	Less	Equal	Less
GEO Impact 3.6-5	LS	Less	Equal	Equal
SECTION 3.7 - GREENHOUSE GASES, CLIMATE CHANGE AND ENERGY (GHG)				
GHG Impact 3.7-1	LS	Less	Equal	Less
GHG Impact 3.7-2	LS	Less	Equal	Less
SECTION 3.8 - HAZARDS AND HAZARDOUS MATERIALS (HAZ)				
HAZ Impact 3.8-1	LS	Less	Equal	Equal
HAZ Impact 3.8-2	LS/MM	Less	Equal	Equal
HAZ Impact 3.8-3	N	Less	Equal	Equal
HAZ Impact 3.8-4	N	Less	Equal	Equal
HAZ Impact 3.8-5	N	Less	Equal	Equal
HAZ Impact 3.8-6	LS	Less	Equal	Equal
SECTION 3.9 - HYDROLOGY AND WATER QUALITY (HYD)				
HYD Impact 3.9-1	LS	Less	Less	Less
HYD Impact 3.9-2	LS	Less	Less	Less
HYD Impact 3.9-3	LS	Less	Less	Less
HYD Impact 3.9-4	LS	Less	Less	Less
HYD Impact 3.9-5	LS	Less	Less	Less
SECTION 3.10 - LAND USE, POPULATION AND HOUSING (LUPH)				
LUPH Impact 3.10-1	LS	Equal	Equal	Equal
LUPH Impact 3.10-2	LS	Equal	Equal	Equal
LUPH Impact 3.10-3	LS	Less	Equal	Less
SECTION 3.11 - NOISE (NOI)				
NOI Impact 3.11-1	LS/MM	Less	Equal	Less
NOI Impact 3.11-2	LS	Less	Equal	Less
SECTION 3.12 - PUBLIC SERVICES AND RECREATION (PSR)				
PS Impact 3.12-1	LS	Less	Equal	Less
PS Impact 3.12-2	LS	Less	Equal	Less
PS Impact 3.12-3	LS	Less	Equal	Less

Environmental Topic	*Proposed Project*	*No Project (No Build) Alternative*	*Increased Density Alternative*	*Lower Density Alternative*
PS Impact 3.12-4	LS	Less	Equal	Less
PS Impact 3.12-5	LS	Less	Equal	Less
Section 3.13 - Transportation and Circulation (TC)				
TC Impact 3.13-1	LS	Less	Less	Less
TC Impact 3.13-2	LS	Less	Less	Less
TC Impact 3.13-3	LS	Less	Less	Less
TC Impact 3.13-4	LS	Less	Less	Less
Section 3.14 - Utilities and Service Systems (UTL)				
UT Impact 3.14-1	LS	Less	Equal	Equal
UT Impact 3.14-2	SU	Less	Greater	Less
UT Impact 3.14-3	LS	Less	Equal	Equal
UT Impact 3.14-4	LS	Less	Less	Less
UT Impact 3.14-5	LS	Less	Equal	Less
UT Impact 3.14-6	LS	Less	Less	Less
UT Impact 3.14-7	LS	Less	Equal	Equal

SUMMARY OF IMPACTS AND MITIGATION MEASURES

In accordance with the CEQA Guidelines, this EIR focuses on the significant effects on the environment. The CEQA Guidelines defines a significant effect as a substantial adverse change in the physical conditions which exist in the area affected by the proposed Project. A less than significant effect is one in which there is no long or short-term significant adverse change in environmental conditions. Some impacts are reduced to a less than significant level with the implementation of mitigation measures and/or compliance with regulations.

The environmental impacts of the proposed Project, the impact level of significance prior to mitigation, the proposed mitigation measures and/or adopted policies and standard measures that are already in place to mitigate an impact, and the impact level of significance after mitigation are summarized in Table ES-2.

The environmental impacts of the proposed Project, the impact level of significance prior to mitigation, the proposed mitigation measures and/or adopted policies and standard measures that are already in place to mitigate an impact, and the impact level of significance after mitigation are summarized in Table ES-2.

TABLE ES-2: PROJECT IMPACTS AND PROPOSED MITIGATION MEASURES

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
AESTHETICS			
Impact 3.1-1: The proposed Project would not result in substantial adverse effects on scenic vistas.	LS		--
Impact 3.1-2: The proposed Project would not degrade the existing visual character or quality of public views of the site and its surroundings and could substantially damage scenic resources within a State Scenic Highway.	LS		--
Impact 3.1-3: The proposed Project would not conflict with the applicable zoning and other regulations governing scenic quality.	LS		--
Impact 3.1-4: The proposed Project would not result in light and glare impacts.	LS		--
AGRICULTURAL RESOURCES			
Impact 3.2-1: The proposed Specific Plan would result in the conversion of Farmlands, including Prime Farmland, Unique Farmland, and Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural uses.	PS	***Mitigation Measure 3.2-1:*** *Prior to the conversion of important farmland in the Development Area, the Project proponents shall participate in the City of Lathrop agricultural mitigation program and the SJMSCP by paying the established fees on a per-acre basis for the loss of important farmland. Fees paid toward the City of Lathrop's program shall include half of the mitigation fee to be paid to the Central Valley Farm Trust (CVFT). The CVFT shall use these funds to purchase conservation easements on agricultural lands to fulfill the compensatory mitigation. The other half of the mitigation fee will be collected by the City of Lathrop and may be passed to the CVFT or other trust, or may be retained by the City of Lathrop to be applied to local easements or other agricultural mitigation. Fees paid toward the SJMSCP shall be in accordance with the fees established at the time they are paid. The SJCOG shall use these funds to purchase conservation easements on agricultural habitat lands to fulfill the compensatory mitigation. Written proof of payment to SJCOG and CVFT shall be provided to the City.*	SU
Impact 3.2-2: The proposed Project has the potential to conflict with existing zoning for	PS	*None Feasible*	SU

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*
PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	LEVEL OF SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURE	RESULTING LEVEL OF SIGNIFICANCE
agricultural use, or Williamson Act Contracts.			
Impact 3.2-3: The proposed Project has the potential to result in conflicts with adjacent agricultural lands or indirectly cause conversion of agricultural lands.	LS		LS
AIR QUALITY			
Impact 3.3-1: Project operation would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment, or conflict or obstruct implementation of the District's air quality plan.	LS		--
Impact 3.3-2: Proposed Project construction activities would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment, or conflict or obstruct implementation of the District's air quality plan.	LS		--
Impact 3.3-3: The proposed Project would not generate carbon monoxide hotspot impacts.	LS		--
Impact 3.3-4: The proposed Project would not generate substantial public exposure to toxic air contaminants.	LS		--
Impact 3.3-5: The proposed Project would not cause exposure to other emissions (such as those leading to odors) adversely affecting a substantial number of people.	LS		--
BIOLOGICAL RESOURCES			
Impact 3.4-1: Implementation of the proposed Project, with mitigation, would not have substantial direct or indirect effects on special-	PS	***Mitigation Measure 3.4-1:*** *The Project applicant shall implement the following measure to avoid or minimize impacts on special-status bumble bees:*	LS

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
status invertebrate species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of an animal community, or a drop in population levels below self-sustaining levels.		• *A qualified biologist(s) shall conduct a preconstruction survey with 7 days of the commencement of work. If special-status bees of any species are observed, they shall be photographed for identification. If construction begins between March 1 and November 1, the ground shall also be searched during the survey for active bumble bee colonies. If bee colonies are identified, these colonies shall be demarcated with a flagged avoidance buffer, as determined by a qualified biologist, and shall be avoided during the active season from March 1 through November 1, or until the qualified biologist has determined that the colony is no longer active or until the colony is relocated.* ***Mitigation Measure 3.4-2:*** *Prior to commencement of any grading activities, the Project proponent shall obtain coverage under the SJMSCP to mitigate for habitat impacts to covered special-status species. Coverage involves compensation for habitat impacts on covered species through implementation of incidental take and minimization measures (ITMMs) and payment of fees for conversion of lands that may provide habitat for covered special-status species. These fees are used to preserve and/or create habitat in preserves to be managed in perpetuity. Obtaining coverage for a Project includes incidental take authorization (permits) under the Endangered Species Act Section 10(a), California Fish and Game Code Section 2081, and the MBTA. Coverage under the SJMSCP would fully mitigate all habitat impacts on covered special-status species.*	
Impact 3.4-2: Implementation of the proposed Project, with mitigation, would not have substantial direct or indirect effects on special-status reptile and amphibian species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a reptile or amphibian community, or a drop in population levels below self-sustaining levels.	PS	*Implement* ***Mitigation Measure 3.4-2****.* ***Mitigation Measure 3.4-3:*** *The Project applicant shall implement the following measure to avoid or minimize impacts on California glossy snake:* • *Prior to the commencement of construction activities, but not more than two (2) days before ground clearance, a qualified biologist shall conduct pre-construction surveys of the Project site for California glossy snake (Arizona elegans occidentalis). If individuals of this species are discovered, a qualified biologist shall capture and translocate individuals to similar habitat in the general vicinity of the Project site. The translocation process shall be conducted until it is determined that all California glossy snake have been removed from the disturbance boundary. The candidate sites for relocation shall be identified before construction and shall be selected based on the size and type of habitat*	LS

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
		present, the potential for negative interactions with resident species, and the species' range. A final report identifying the number of animals moved and any mortality identified during the relocation event shall be completed at the end of construction. The disturbance zone shall be cleared of vegetation as soon after clearance of these species as possible to ensure the species do not re-enter the disturbance area. As part of the worker environmental training awareness program, Project personnel shall be trained to identify this species, its natural history, its habitat, and protective measures.	
Impact 3.4-3: Implementation of the proposed Project, with mitigation, would not have substantial direct or indirect effects on special-status bird species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a bird community, or a drop in population levels below self-sustaining levels.	PS	*Implement **Mitigation Measure 3.4-2**.*	LS
Impact 3.4-4: Implementation of the proposed Project, with mitigation, would not have substantial direct or indirect effects on special-status mammal species, including through substantial reduction of habitat, substantial reduction of the number or restriction of the range of a listed species, elimination of a mammal community, or a drop in population levels below self-sustaining levels.	PS	*Implement **Mitigation Measure 3.4-2**.* ***Mitigation Measure 3.4-4**: The Project applicant shall implement the following measure to avoid or minimize impacts on special-status bat species:* • *Prior to grading of each phase, the Project applicant shall conduct a survey of the area to be graded for bat roosts, and if present, the Project applicant shall implement the following measures to avoid or minimize impacts on special-status bats:* ○ *If removal of suitable roosting areas (i.e., buildings, trees, shrubs, bridges, etc.) must occur during the bat pupping season (April 1 through July 31), surveys for active maternity roosts shall be conducted by a qualified biologist. The surveys shall be conducted from dusk until dark.* ○ *If a special-status bat maternity roost is located, appropriate buffers around the roost sites shall be determined by a qualified biologist and implemented to avoid destruction or abandonment of the roost resulting from habitat removal or other project activities. The size of the buffer shall depend on the*	LS

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*
PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
		species, roost location, and specific construction activities to be performed in the vicinity. No project activity shall commence within the buffer areas until the end of the pupping season (August 1) or until a qualified biologist confirms the maternity roost is no longer active. ○ *If a non-maternal roost is located, eviction and exclusion techniques shall be conducted as recommended by the qualified biologist. Methods may include opening the roosting area to change the air flow and lighting, installing one-way doors, or other appropriate methods that allow the bats to exit and find a new roost. After eviction is believed to be completed, acoustic monitoring, and an evening emergence survey shall be performed by the qualified biologist to ensure eviction is complete. For tree removal, a two-step tree removal process involving removal of all branches that do not provide roosting habitat on the first day, and then the next day cutting down the remaining portion of the tree.*	
Impact 3.4-5: Implementation of the proposed Project would not have substantial direct or indirect effects on candidate, sensitive, or special-status plant species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a plant community, or a drop in population levels below self-sustaining levels.	LS		--
Impact 3.4-6: Implementation of the proposed Project would not have substantial direct or indirect effects on candidate, sensitive, or special-status fish species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a fish community, or a drop in population levels below self-sustaining levels.	LS		--
Impact 3.4-7: Implementation of the proposed Project would not cause a substantial adverse	LS		--

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	LEVEL OF SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURE	RESULTING LEVEL OF SIGNIFICANCE
effect on protected wetlands and jurisdictional waters.			
Impact 3.4-8: Implementation of the proposed Project would not result in adverse effects on riparian habitat or other sensitive natural community.	LS		--
Impact 3.4-9: Implementation of the proposed Project would not interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	LS		--
Impact 3.4-10: Implementation of the proposed Project, with mitigation, would not conflict with an adopted Habitat Conservation Plan.	PS	*Implement* ***Mitigation Measure 3.4-2***	LS
Impact 3.4-11: Implementation of the proposed Project, with mitigation, would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	LS		--
CULTURAL AND TRIBAL RESOURCES			
Impact 3.5-1: Implementation of the proposed Project, with mitigation, would not cause a substantial adverse change to a significant historical resource, as defined in CEQA Guidelines §15064.5.	PS	***Mitigation Measure 3.5-1:*** *Prior to any ground-disturbing activities in the area of the Project site which may contain a prehistoric site (as shown in the confidential appendix included as part of the confidential version of the Cultural Resources Assessment for the Mossdale Landing West Project, Peak & Associates, Inc., March 18, 2024; refer to as Appendix C.1, Cultural Resources Assessment), the Project proponent shall develop and implement an Archaeological Monitoring Program, whereby the Project proponents shall retain the services of an experienced archaeologist who will be present on-site to observe ground-disturbing activities requiring grubbing, grading, trenching, or excavation in the area of the Project site which may contain a prehistoric site. The Archaeological Monitor will be given access to inspect all ground surface and subsurface modifications,*	LS

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*
PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
		excavations, installations, equipment parking, and any other construction-related activities on the area of the Project site which may contain a prehistoric site. *The archaeological monitoring will consist of on-the-ground and close observation by an experienced archaeologist for any kind of archaeological or cultural remains that might be exposed during ground-disturbing construction activities. Construction activities in the area of the Project site which may contain a prehistoric site will be monitored by following the construction equipment as it removes or modifies soils and vegetation, and may involve walking cuts or excavations after the machinery has passed, or standing to the side and observing the soil removal activity. The archaeologist on-site will be given "stop work authority" so that in the event that they observe a change in soil conditions and/or artifacts or structural remains, they shall bring all construction activities within a 200-foot radius of the area to a stop so that they may further assess the find. Further ground disturbances in the vicinity of the find will remain stopped while an assessment is underway and until the archaeologist on-site can provide recommendations for treatment of the discovery. If a potentially significant find cannot be avoided by the Project, the retained archaeologist, who meets the Secretary of the Interior's Professional Qualifications Standards, will develop an evaluation plan in consultation with the City that contains a research design to guide assessments of the resource's significance and scientific potential.* ***Mitigation Measure 3.5-2:*** *Prior to any ground-disturbing activities on any portion of the Project site, a qualified archaeologist and native American monitor shall conduct pre-construction worker cultural resources sensitivity training. The training session shall focus on the recognition of the types of historical and cultural, including Native American, resources that could be encountered, procedures to be followed if resources are found, and pertinent laws protecting these resources. Those in attendance shall be recorded, with records maintained on-site. Any new workers that were not part of the initial training shall be required to undergo a new training session.*	
Impact 3.5-2: Implementation of the proposed Project, with mitigation, would not cause a substantial adverse change to a significant cultural resource, as defined in CEQA Guidelines §15064.5.	PS	*Implement* ***Mitigation Measures 3.5-1 and 3.5-2.***	LS

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
Impact 3.5-3: Project implementation would not disturb human remains, including those interred outside of formal cemeteries.	LS		--
Impact 3.5-4: Implementation of the proposed Project, with mitigation, would not cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074.	PS	*Implement **Mitigation Measures 3.5-1 and 3.5-2.*** ***Mitigation Measure 3.5-3:** Prior to any ground-disturbing activities in the area of the Project site which may contain a prehistoric site (as shown in the confidential appendix included as part of the confidential version of the Cultural Resources Assessment for the Mossdale Landing West Project, Peak & Associates, Inc., March 18, 2024; refer to as Appendix C.1, Cultural Resources Assessment), the Project proponent shall retain a Native American Monitor. The monitor shall be retained prior to the commencement of any "ground-disturbing activity" in the area of the Project site which may contain a prehistoric site. "Ground-disturbing activity" shall include, but is not limited to, demolition, pavement removal, potholing, auguring, grubbing, tree removal, boring, grading, excavation, drilling, and trenching. Upon discovery of any tribal cultural resources (TCRs), all construction activities in the immediate vicinity of the discovery shall cease (i.e., not less than the surrounding 50 feet) and shall not resume until the discovered TCR has been fully assessed by the Native American Monitor. The monitor shall recover and retain all discovered TCRs in the form and/or manner the Tribe deems appropriate, in the Tribe's sole discretion, and for any purpose the Tribe deems appropriate, including for educational, cultural and/or historic purposes.*	LS
GEOLOGY AND SOILS			
Impact 3.6-1: Implementation of the proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic related ground failure, or landslides.	LS		--
Impact 3.6-2: Implementation of the proposed Project would not result in substantial soil erosion or the loss of topsoil.	LS		--

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
Impact 3.6-3: Implementation of the proposed Project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of Project implementation, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.	LS		--
Impact 3.6-4: Implementation of the proposed Project would not result in development on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.	LS		--
Impact 3.6-5: Implementation of the proposed Project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	LS		--
GREENHOUSE GASES, CLIMATE CHANGE AND ENERGY			
Impact 3.7-1: Project implementation would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment and would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	LS		--
Impact 3.7-2: Project implementation would not result in the inefficient, wasteful, or unnecessary use of energy resources, and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LS		--

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
HAZARDS AND HAZARDOUS MATERIALS			
Impact 3.8-1: Implementation of the proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	LS		--
Impact 3.8-2: Implementation of the proposed Project, with mitigation, would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	PS	***Mitigation Measure 3.8-1****: In the event that hazardous materials are encountered during construction, a Soils Management Plan (SMP) shall be submitted and approved by the San Joaquin County Department of Environmental Health. The SMP shall establish management practices for handling hazardous materials, including fuels, paints, cleaners, solvents, etc., during construction. The approved SMP shall be posted and maintained onsite during construction activities and all construction personnel shall acknowledge that they have reviewed and understand the plan.* ***Mitigation Measure 3.8-2****: Prior to initiation of any ground disturbance activities, evenly distributed soil samples shall be conducted throughout the Project site for analysis of pesticides and heavy metals. The samples shall be submitted for laboratory analysis of pesticides and heavy metals per DTSC and EPA protocols. The results of the soil sampling shall be submitted to the City of Lathrop and the San Joaquin County Environmental Health Department. If elevated levels of pesticides or heavy metals are detected during the laboratory analysis of the soils, a soil cleanup and remediation plan shall be prepared and implemented prior to the commencement of grading activities.*	LS
Impact 3.8-3: Implementation of the proposed Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	LS		--
Impact 3.8-4: Implementation of the proposed Project would not result in impacts from being included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.	LS		--

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	LEVEL OF SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURE	RESULTING LEVEL OF SIGNIFICANCE
Impact 3.8-5: The proposed Project would not be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, resulting in a safety hazard or excessive noise for people residing or working in the Project site.	LS		--
Impact 3.8-6: Implementation of the proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LS		--
HYDROLOGY AND WATER QUALITY			
Impact 3.9-1: The proposed Project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.	LS		--
Impact 3.9-2: Project implementation would not deplete groundwater supplies or interfere substantially with groundwater recharge.	LS		--
Impact 3.9-3: The proposed Project would not alter the existing drainage pattern of the site or area, including the alteration of the course of a river or through the addition of impervious surfaces, in a manner which would result in substantial erosion, siltation, surface runoff, flooding, or polluted runoff.	LS		--
Impact 3.9-4 Implementation of the proposed Project would not risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones.	LS		--
Impact 3.9-5: The proposed Project would not conflict with or obstruct implementation of a water quality control plan or sustainable	LS		--

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
groundwater management plan.			
LAND USE, POPULATION, AND HOUSING			
Impact 3.10-1: The proposed Project would not physically divide an established community, or displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.	LS		--
Impact 3.10-2: The proposed Project would not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project adopted to avoid or mitigate an environmental effect.	LS		--
Impact 3.10-3: The proposed Project has the potential to induce substantial population growth in an area.	LS		--
NOISE			
Impact 3.11-1: The Project, with mitigation, would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	PS	***Mitigation Measure 3.11-1:*** *The following measures shall be implemented during construction of the Project:* • *Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the hours of 7:00 a.m. and 10:00 p.m. Sunday through Thursday and between 9:00 a.m. and 11:00 p.m. on Friday, Saturday, and legal holidays.* • *Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.* • *When not in use, motorized construction equipment shall not be left idling for more than 5 minutes.* • *Stationary equipment (power generators, compressors, etc.) shall be located at the farthest practical distance from nearby noise-sensitive land uses or*	LS

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*
PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
		sufficiently shielded to reduce noise-related impacts. *These requirements shall be noted in the improvements plans prior to approval by the City's Public Works Department.*	
Impact 3.11-2: The Project would not generate excessive groundborne vibration or groundborne noise levels.	LS		--
Public Services and Recreation			
Impact 3.12-1: The proposed project will not result in or require the construction of police department facilities which may cause substantial adverse physical environmental impacts.	LS		--
Impact 3.12-2: The proposed project will not require the construction of fire department facilities which may cause substantial adverse physical environmental impacts.	LS		--
Impact 3.12-3: The proposed Project will not increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated, but the proposed Project will require the construction of park and recreational facilities which may cause substantial adverse physical environmental impacts.	LS		--
Impact 3.12-4: Project implementation will not result in the need for the construction of new schools which have the potential to cause substantial adverse physical environmental impacts.	LS		--
Impact 3.12-5: The proposed Project will not have significant effects on other public facilities.	LS		--

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	LEVEL OF SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURE	RESULTING LEVEL OF SIGNIFICANCE
TRANSPORTATION AND CIRCULATION			
Impact 3.13-1: Implementation of the Project would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.	LS		--
Impact 3.13-2: Implementation of the Project would not conflict with or be inconsistent with CEQA Guideline section 15064.3, subdivision (b).	LS		--
Impact 3.13-3: Implementation of the Project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	LS		--
Impact 3.13-4: Implementation of the Project would not result in inadequate emergency access.	LS		--
UTILITIES			
Impact 3.14-1: Implementation of the proposed Project would not require or result in the relocation or construction of new or expanded water facilities, the construction or relocation of which could cause significant environmental effects.	LS		--
Impact 3.14-2: The proposed Project would not have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years.	PS	***None feasible***	SU
Impact 3.14-3: Implementation of the proposed Project would not require or result in the	LS		--

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*
PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	LEVEL OF SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURE	RESULTING LEVEL OF SIGNIFICANCE
construction of new wastewater treatment or collection facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.			
Impact 3.14-4: Implementation of the proposed Project would not result in a determination by the wastewater treatment provider which serves the Project that it does not have adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments.	LS		--
Impact 3.14-5: Implementation of the proposed Project would not require or result in the relocation or construction of new or expanded stormwater drainage facilities, the construction or relocation of which could cause significant environmental effects.	LS		--
Impact 3.14-6: Implementation of proposed Project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; and would comply with federal, State, and local management and reduction statutes and regulations related to solid waste.	LS		--
Impact 3.14-7: Implementation of the proposed Project would not require or result in the construction of new electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects.	LS		--

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
CUMULATIVE IMPACTS			
Impact 4.1: Cumulative Damage to Scenic Resources within a State Scenic Highway	LS		--
Impact 4.2: Cumulative Conflicts with the Applicable Zoning and Other Regulations Governing Scenic Quality	LS		--
Impact 4.3: Cumulative Impact on Light and Glare	LS		--
Impact 4.4: Cumulative Impact on Agricultural Resources	PS		CC and SU
Impact 4.5: Cumulative Impact on the Region's Air Quality	LS		--
Impact 4.6: Cumulative Loss of Biological Resources Including Habitats and Special Status Species	LS		--
Impact 4.7: Cumulative Impacts on Known and Undiscovered Cultural and Tribal Resources	LS		--
Impact 4.8: Cumulative Impact on Geologic and Soils Resources	LS		--
Impact 4.9: Cumulative Impact on Climate Change from Increased Project-Related Greenhouse Gas Emissions	LS		--
Impact 4.10: Cumulative Impact Related to Hazards and Hazardous Materials	LS		--
Impact 4.11: Cumulative Increases in Peak Stormwater Runoff from the Specific Plan Area	LS		--
Impact 4.12: Cumulative Impacts Related to Degradation of Water Quality	LS		--
Impact 4.13: Cumulative Impacts Related to Degradation of Groundwater Supply or Recharge	LS		--
Impact 4.14: Cumulative Impacts Related to Flooding	LS		--

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
Impact 4.15: Cumulative Impact on Communities and Local Land Uses	LS		--
Impact 4.16: Cumulative Impacts on Population and Housing	LS		--
Impact 4.17: Cumulative Exposure of Existing and Future Noise-Sensitive Land Uses to Increased Noise Resulting from Cumulative Development	LS		--
Impact 4.18: Cumulative Impact on Public Services	LS		--
Impact 4.19: Under Cumulative conditions, the proposed Project would conflict with or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)	LS		--
Impact 4.20: Under Cumulative conditions, the proposed Project would not adversely affect pedestrian and bicycle facilities	LS		--
Impact 4.21: Cumulative Impact on Water Utilities	LS		--
Impact 4.22: Cumulative Impact on Wastewater Utilities	LS		--
Impact 4.23: Cumulative Impact on Stormwater Facilities	LS		--
Impact 4.24: Cumulative Impact on Solid Waste Facilities	LS		--
Impact 4.25: Cumulative Impact on Energy and Telecommunications	LS		--

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *B – beneficial impact* *SU – significant and unavoidable*

1.1 PURPOSE AND INTENDED USES OF THE EIR

The City of Lathrop, as the lead agency, determined that the proposed Mossdale Landing West Specific Plan Project is a "project" within the definition of CEQA, and is referred to herein as the "Project". CEQA requires the preparation of an Environmental Impact Report (EIR) prior to approving any project that may have a significant impact on the environment. For the purposes of CEQA, the term "project" refers to the whole of an action, which has the potential for resulting in a direct physical change or a reasonably foreseeable indirect physical change in the environment (CEQA Guidelines Section 15378[a]).

An EIR must disclose the expected environmental impacts, including impacts that cannot be avoided, growth-inducing effects, impacts found not to be significant, and significant cumulative impacts, as well as identify mitigation measures and alternatives to the proposed project that could reduce or avoid its adverse environmental impacts. CEQA requires government agencies to consider and, where feasible, minimize significant environmental impacts of proposed development. CEQA also requires agency decision-makers, when considering the approval of projects with significant unavoidable environmental effects, to balance a variety of public objectives, including economic, environmental, and social factors.

The City of Lathrop, as the lead agency, has prepared this Draft EIR to provide the public and responsible and trustee agencies with an objective analysis of the potential environmental impacts resulting from implementation of the proposed Project. The environmental review process enables interested parties to evaluate the proposed Project in terms of its environmental consequences, to examine and recommend methods to eliminate or reduce potential adverse impacts, and to consider a reasonable range of alternatives to the proposed Project. This EIR will be used by the City Council of the City of Lathrop to determine whether to approve, modify, or deny the proposed Project and associated approvals in light of the Project's environmental effects. The EIR will be used as the primary environmental document to evaluate full development, all associated infrastructure improvements, and permitting actions associated with the proposed Project. All of the actions and components of the proposed Project are described in detail in Chapter 2.0, Project Description.

1.2 TYPE OF EIR

The State CEQA Guidelines identify several types of EIRs, each applicable to different project circumstances. This EIR has been prepared as a Project-level EIR, described in State CEQA Guidelines § 15161 as: "The most common type of EIR (which) examines the environmental impacts of a specific development project. This type of EIR should focus primarily on the changes in the environment that would result from the development project. The EIR shall examine all phases of the project including planning, construction, and operation. The project-level analysis considers the broad environmental effects of the proposed Project.

1.3 RESPONSIBLE AND TRUSTEE AGENCIES

CEQA generally requires that Notices of Preparation (NOPs) and Draft EIRs be circulated to "responsible agencies" and "trustee agencies." As required by CEQA, this EIR defines lead, responsible, and trustee agencies. The City of Lathrop is the "Lead Agency" for the project because it holds principal responsibility for approving the project. The term "Responsible Agency" includes all public agencies other than the Lead Agency that have discretionary approval power over the project or an aspect of the project (CEQA Guidelines Section 15381). For the purpose of CEQA, a "Trustee" agency has jurisdiction by law over natural resources that are held in trust for the people of the State of California. CEQA Guidelines Section 15386 recognizes four particular trustee agencies: (a) the California Department of Fish and Wildlife with regard to the fish and wildlife of the State, to designated rare or endangered native plants, and to game refuges, ecological reserves, and other areas administered by the department; (b) the State Lands Commission with regard to State owned "sovereign" lands such as the beds of navigable waters and State school lands; (c) the State Department of Parks and Recreation with regard to units of the State Park System; and (d) The University of California with regard to sites within the Natural Land and Water Reserves System.

The following agencies may be required to issue permits or approve certain aspects of the proposed Project. Other governmental agencies that may require approvals in connection with the Project include, but are not limited to, the following:

- Regional Water Quality Control Board (RWQCB) – Construction activities would be required to be covered under the National Pollution Discharge Elimination System (NPDES);
- RWQCB – The Storm Water Pollution Prevention Plan (SWPPP) would be required to be approved prior to construction activities pursuant to the Clean Water Act;
- San Joaquin Valley Air Pollution Control District (SJVAPCD) – Construction activities would be subject to the SJVAPCD codes and requirements.
- San Joaquin Council of Governments, Inc. – Coverage under the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP)

1.4 ENVIRONMENTAL REVIEW PROCESS

The review and certification process for the EIR has involved, or will involve, the following general procedural steps:

NOTICE OF PREPARATION

The City of Lathrop circulated a NOP of an EIR for the proposed Project on March 22, 2024 to State Clearinghouse, State Responsible Agencies, State Trustee Agencies, Other Public Agencies, and Organizations and Interested Persons. A public scoping meeting was held on April 3, 2024 to present the project description to the public and interested agencies, and to receive comments from the public and interested agencies regarding the scope of the environmental analysis to be included in the Draft EIR. Concerns raised in response to the NOP were considered during preparation of the Draft EIR. The IS and NOP comments are presented in Appendix A.

DRAFT EIR

This document constitutes the Draft EIR. The Draft EIR contains a description of the proposed Project, description of the environmental setting, identification of project impacts, and mitigation measures for impacts found to be significant, as well as an analysis of project alternatives, identification of significant irreversible environmental changes, growth-inducing impacts, and cumulative impacts. This Draft EIR identifies environmental categories for which the Project was determined to have no impacts or less than significant impacts, and provides detailed analysis of potentially significant and significant impacts. Comments received in response to the NOP were considered in preparing the analysis in this EIR. Upon completion of the Draft EIR, the City of Lathrop will file the Notice of Completion (NOC) with the State Clearinghouse of the Governor's Office of Planning and Research to begin the public review period. Additionally, the City of Lathrop will file the Notice of Availability with the County Clerk and have it published in a newspaper of regional circulation to begin the local public review period.

PUBLIC NOTICE/PUBLIC REVIEW

The City of Lathrop will provide a public notice of availability for the Draft EIR, and invite comment from the general public, agencies, organizations, and other interested parties. Consistent with CEQA, the review period for this Draft EIR is forty-five (45) days. Public comment on the Draft EIR will be accepted in written form. All comments or questions regarding the Draft EIR should be addressed to:

Attn: Rick Caguiat, Community Development Director
City of Lathrop, Community Development Department
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7290
planning@ci.lathrop.ca.us

RESPONSE TO COMMENTS/FINAL EIR

Following the public review period, a Final EIR will be prepared. The Final EIR will respond to significant environmental issues raised either in written comments received during the public review period or in oral comments received at a public hearing during such review period.

CERTIFICATION OF THE EIR/PROJECT CONSIDERATION

CEQA Guidelines Section 15090 requires that, prior to approving a project, a lead agency's decisionmaker or decisionmaking body must first "certify" the Final EIR prepared for the project. Here, for this proposed Project, the City Council City will be the City's ultimate decision-making body. In order to certify the Final EIR, the City Council will have to specifically certify that (i) the Final EIR has been completed in compliance with CEQA; (ii) that the Final EIR was presented to the decision-making body (the City Council), which reviewed and considered the information contained in the Final EIR prior to approving the project; and (iii) that the Final EIR reflects the lead agency's independent judgment and analysis. In general, an EIR has been completed "in compliance with CEQA" if the document meets applicable legal content requirements; shows a good faith effort at full disclosure of environmental information; and provides sufficient analysis to allow decisions to be made regarding the proposed project in contemplation of environmental considerations.

The level of detail contained throughout this EIR is consistent with Section 15151 of the CEQA Guidelines and recent court decisions, which provide the standard of adequacy on which this document is based. That provision state as follows:

> *"An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of the environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure."*

Following review and consideration of the Final EIR, the City Council may take action to approve, modify, or reject the Project. If the City Council approves or modifies the proposed Project, or chooses to approve one of the project alternatives set forth in this EIR, the City Council will have to adopt "CEQA Findings" pursuant to CEQA Guidelines section 15091. These findings are necessary to effectuate the substantive mandate of CEQA, as set forth Public Resources Code section 21002. That statute provides that "public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects."

The mandate announced in section 21002 is implemented, in part, through the requirement that agency decisionmakers must adopt findings before approving projects for which EIRs are required. For each significant environmental effect identified in an EIR for a project, the approving body must issue a written finding reaching one or more of three permissible conclusions. The first such finding is that changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effect as identified in the Final EIR. The second permissible finding is that such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding, and that such changes have been adopted by such other agency or can and should be adopted by such other agency. The third potential conclusion is that specific economic, legal, social, technological, or other considerations, including provision of employment opportunities, make infeasible the mitigation measures or project alternatives identified in the Final EIR. (See CEQA Guidelines Section 15091[a]; see also Public Resources Code Section 21081[a].)

Because the Project as proposed and the alternatives other than "No Project" would have significant unavoidable environmental impacts, the City Council would also have to adopt, as part of any approval action, a Statement of Overriding Considerations. It must identify the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, that the City Council determines outweigh the Project's or Alternative's unavoidable adverse environmental effects, thereby rendering them "acceptable." (See CEQA Guidelines Section 15093.)

Finally, as part of project approval, CEQA will require the City Council to adopt a Mitigation Monitoring and Reporting Program prepared in accordance with Public Resources Code Section 21081.6(a) and CEQA Guidelines Section 15097. This Mitigation Monitoring and Reporting Program must include all of the mitigation measures that have been incorporated into or imposed upon the Project to reduce or avoid significant effects on the environment, and must be designed to ensure that these measures are actually carried out during project implementation.

1.5 ORGANIZATION AND SCOPE

Sections 15122 through 15132 of the State CEQA Guidelines identify the content requirements for Draft and Final EIRs. An EIR must include a description of the environmental setting, an environmental impact analysis, mitigation measures, alternatives, significant irreversible environmental changes, growth-inducing impacts, and cumulative impacts. Discussion of the environmental issues addressed in the Draft EIR was established through review of environmental and planning documentation developed for the proposed Project, environmental and planning documentation prepared for recent projects located within the City of Lathrop, applicable local and regional planning documents, and responses to the NOP.

This Draft EIR is organized in the following manner:

EXECUTIVE SUMMARY

This Executive Summary summarizes the characteristics of the proposed Project, known areas of controversy and issues to be resolved, and provides a concise summary matrix of the proposed Project's environmental impacts and possible mitigation measures. This chapter identifies alternatives that reduce or avoid at least one significant environmental effect of the proposed Project.

CHAPTER 1.0 – INTRODUCTION

Chapter 1.0 briefly describes the purpose of the environmental evaluation, identifies the lead, trustee, and responsible agencies, summarizes the process associated with preparation and certification of an EIR, and identifies the scope and organization of the Draft EIR.

CHAPTER 2.0 – PROJECT DESCRIPTION

Chapter 2.0 provides a detailed description of the proposed Project, including the location, intended objectives, background information, the physical and technical characteristics, including the decisions subject to CEQA, related improvements, and a list of related agency action requirements.

CHAPTER 3.0 – ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Chapter 3.0 contains an analysis of environmental topic areas as identified below. Each subchapter addressing a topical area is organized as follows:

Environmental Setting. A description of the existing environment as it pertains to the topical area.

Regulatory Setting. A description of the regulatory environment that may be applicable to the proposed Project.

Impacts and Mitigation Measures. Identification of the thresholds of significance by which impacts are determined, a description of project-related impacts associated with the environmental topic, identification of appropriate mitigation measures, and a conclusion as to the significance of each impact.

The following environmental topics are addressed in this section:

- Aesthetics
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural and Tribal Resources
- Geology and Soils
- Greenhouse Gases, Climate Change and Energy
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use, Population and Housing
- Noise
- Public Services and Recreation
- Transportation and Circulation
- Utilities

CHAPTER 4.0 – OTHER CEQA-REQUIRED TOPICS

Chapter 4.0 evaluates and describes the following topics required by CEQA: impacts considered less-than-significant, significant and irreversible impacts, growth-inducing effects, cumulative, and significant and unavoidable environmental effects.

CHAPTER 5.0 – ALTERNATIVES TO THE PROJECT

State CEQA Guidelines Section 15126.6 requires that an EIR describe a range of reasonable alternatives to the proposed Project, which could feasibly attain most of the basic objectives of the proposed Project and avoid and/or lessen any of the significant environmental effects of the proposed Project. Chapter 5.0 provides a comparative analysis between the environmental impacts of the proposed Project and the selected alternatives.

CHAPTER 6.0 – REPORT PREPARERS

This section lists all authors and agencies that assisted in the preparation of the EIR, by name, title, and company or agency affiliation.

APPENDICES

This section includes all notices and other procedural documents pertinent to the EIR, as well as technical material prepared to support the analysis.

1.6 COMMENTS RECEIVED ON THE NOTICE OF PREPARATION

The City of Lathrop received nine written comment letters on the NOP for the proposed Project. A copy of the letters is provided in Appendix A of this Draft EIR. The commenting agency/citizen is provided below.

- California Department of Conservation (April 17, 2024);
- California Department of Transportation (April 22, 2024);
- Central Valley Regional Water Quality Control Board (April 22, 2024);
- Native American Heritage Commission (March 25, 2024);
- Pacific Gas and Electric Company (March 27, 2024);
- Pacific Gas and Electric Company (May 8, 2024);
- San Joaquin Council of Governments, Inc. (March 27, 2024);
- San Joaquin County Environmental Health Department (April 8, 2024); and
- San Joaquin Valley Air Pollution Control District (April 24, 2024).

This page left intentionally blank.

2.1 PROJECT LOCATION

The Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site) is located within the West Lathrop Specific Plan (WLSP) area in the City of Lathrop, San Joaquin County, California (Figures 2.0-1 and 2.0-2). The site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south.

The Project site includes two distinct planning boundaries defined below. The following terms are used throughout this Draft EIR to describe the planning boundaries within the Project site:

- **Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site)** – totals 225.86 acres and includes the whole of the Project, including the proposed 167.42-acre Development Area, and land along the San Joaquin River (which would not be developed as part of the proposed Project).
- **Development Area** – includes 167.42 acres that is intended for development.

The Specific Plan Area is comprised of the following APNs (Figure 2.0-3):

- 191-190-74;
- 191-190-75;
- 191-190-76;
- 191-190-77;
- 191-190-78;
- 191-340-03;
- 191-610-02;
- 191-610-22;
- 191-620-50; and
- 191-620-59.

SITE TOPOGRAPHY

The elevation of the site is generally flat and ranges from approximately 14 feet to 21 feet above mean sea level (MSL). The majority of the site is flat, with slopes existing along the San Joaquin River.

EXISTING SITE USES

The majority of the Plan Area is currently undeveloped (Figure 2.0-4). There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

EXISTING SURROUNDING USES

Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

2.2 PROJECT GOALS AND OBJECTIVES

Consistent with CEQA Guidelines Section 15124(b), a clear statement of objectives and the underlying purpose of the proposed Project shall be discussed.

OVERALL PROJECT OBJECTIVES

The underlying purpose of the proposed Project is the approval and subsequent implementation of the Specific Plan as a means of increasing the housing supply in San Joaquin County and the State of California.

- Complete neighborhoods which foster a mixture of compatibly scaled housing types on urban lots.
- A residential development that will incorporate traditional elements found throughout Central Valley communities including a hierarchy of interconnected streets, the incorporation of assorted architectural styles, tree lined thoroughfares, an emphasis upon pedestrian scale and access with a nod to the agricultural traditions of the Valley.
- Street patterns which are carefully configured to allow for multiple outlets from neighborhoods, and to provide for connections between neighborhoods, without encouraging through traffic to create convenience and access without a private automobile.
- A network of planned walkways and bikeways which make getting outside convenient, easy and enjoyable.
- Durable construction materials and designs suited to local conditions to contribute to the ongoing costs of the housing will be encouraged.
- Provide a range of housing opportunities to support a diverse population, lifestyles, and family groups.
- Establish a planning/zoning concept that is responsive to the market.
- Implement the Phasing Plan for logical development in line with the West Lathrop Specific Plan.
- Implement City's Infrastructure Master Plans.

2.3 PROJECT DESCRIPTION

The Mossdale Landing West Specific Plan (Specific Plan or Project) would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements over five phases (Figure 2.0-5 and Figure 2.0-6). The Mossdale Landing West Specific Plan is based upon the Mossdale Village plan and policies presented in the West Lathrop Specific Plan (WLSP), which is consistent with the City of Lathrop's General Plan. The Specific Plan provides the approximate acreages of the following land uses:

- approximately 146.7 acres of low-density residential uses;
- approximately 16.5 acres of Public designated uses that are made up of:
    - approximately 4.8 acres of linear park;
    - approximately 6.2 acres of neighborhood park;

- approximately 2.0 acres of parkland dedication south of River Islands Parkway;
- approximately 2.1 acres of other open space (including landscaped entries); and
- approximately 1.4 acres of levee slope easement.

There is also a remainder of 38.2 acres of undeveloped land.

RESIDENTIAL

The Specific Plan provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units / acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the analysis is conservative as the number of units constructed at buildout would likely be closer to 829, as shown on the Vesting Tentative Subdivision Map.

The Specific Plan will provide a singular housing type: low-density, single-family, detached housing units, governed by the development standards under Low Density in the WLSP. WLSP defines Low Density as 3 to 9 dwelling units per net acre with maximum coverage of 50 percent. For the proposed residential uses, four lot sizes are proposed ranging from 3,360 square feet to 5,000 square feet with two different lot frontage widths and three different lot lengths. The following lot dimensions would be provided: 42 feet by 80 feet, 42 feet by 85 feet, 50 feet by 80 feet, and 50 feet by 100 feet.

PARKS AND LANDSCAPING

The Specific Plan will feature two park areas: a 6.2-acre park near the center of the subdivision, and a 30-foot wide, 4.8-acre linear park around the perimeter where the site is adjacent to the San Joaquin River. In addition, each major road right-of-way will include street trees, which will be a mixture of evergreen and deciduous varieties best suited to the climate, spaced 30 to 40 feet on center. Every residential lot will have a minimum of one street tree. The park spaces will include street trees, accent trees, low water use shrubs and turf. There is also a two-acre parkland dedication south of Towne Center Drive that may or may not be developed as a part of the proposed Project.

Irrigation for the landscaping will be provided as follows:

- Root watering systems for the trees;
- Rotor/rotary for turf; and
- Point source for shrubs.

The Specific Plan includes landscape architectures standards. Landscaping would be provided throughout the Plan Area, such as along roadways, paths, and parks. Tree species with invasive characteristics would be avoided. When selecting plant species, species that would minimize maintenance challenges would be preferred. Evergreen shrubs would be utilized where appropriate for screening of fences or utility structures. A mix of deciduous and evergreen tree varieties would be utilized to create interest throughout the seasons. Traditional “lawn” species would be highly discouraged in parkway strips and should be limited to parks and public open spaces for recreational use. Further, deep rooting species that use less water would be utilized when “lawn” species are used.

CIRCULATION

The Specific Plan will include a network of arterial streets, collector streets, and local streets (Figure 2.0-7). The local roads will be designed according to City of Lathrop standards with a 56-foot right-of-way. The one exception would Towne Center Drive, which will have a City standard 80-foot right-of-way width. Existing Towne Centre Drive south of River Islands Parkway will be extended under River Islands Parkway and continue north through the Mossdale West site to Barbara Terry Boulevard. Full frontage improvements will be added to the extension south of River Islands Parkway. Additionally, the scope of the Project includes widening the existing River Islands Parkway and Barbara Terry Boulevard with full frontage improvements where they are adjacent to the site to the ultimate right-of-way widths of 156 feet and 45 feet to 52 feet respectively.

The Specific Plan will include bicycle, pedestrian, and transit facilities (Figures 2.0-7 and 2.0-8). Pedestrian walkways would be provided along all local streets. Class II bike lanes will be provided along the proposed arterial and collector streets. A multi-use trail with a Class I bike path would be provided along the San Joaquin River. Additionally, two bus stops are proposed along Street W.

UTILITIES

Sanitary sewer, water and storm drain systems will be built in the rights-of-way of the proposed streets and will connect to nearby existing systems (Figure 2.0-9).

The proposed Project would connect to existing City infrastructure to provide water, sewer, and storm drainage utilities. Existing storm drain, sewer, water, and gas lines/pipes are currently located within the roadways of the adjacent residential uses to the north and west.

The Project would be served by the following existing service providers:

1. City of Lathrop for water;
2. City of Lathrop for wastewater collection and treatment;
3. City of Lathrop for stormwater collection; and
4. Pacific Gas and Electric Company for gas and electricity.

Utility extensions would be installed to provide services to the Project. Utility lines within the Project site and adjacent roadways would be extended throughout the Project site. Wastewater, water, and storm drainage lines would be connected via existing lines along the various residential roadways adjacent north and west of the site.

The water system for Mossdale Landing West will be designed and constructed according to the City's 2019 Water System Master Plan.

The wastewater system for Mossdale Landing West will be designed and constructed according to the City's 2019 Wastewater System Master Plan. Wastewater from the Mossdale Landing West site will be directed via a gravity system to the existing Mossdale Pump Station, located near the northwest corner of the intersection of River Islands Parkway and McKee Boulevard. From there, it will travel via force main to be treated at the City-owned Lathrop Consolidated Treatment Facility, which is located on S Howland

Road, northeast of the Interstate 5/120 Interchange. Upgrades may be required to the pump station and the downstream system to accommodate wastewater from the Mossdale Landing West site.

According to the Mossdale Landing Master Drainage Plan, the Mossdale Village drainage shed is divided into six sub-sheds with a combined area of 912 acres. Each sub-shed functions independently and has its own pump station, storm water quality basin or vault and flood control detention basin. Underground detention solutions are permitted to be used where appropriate. Each sub-shed is required to treat the first flush storm event, which is the volume of water equal to the 85th percentile of a 24-hour storm event. The pumps will begin to discharge water to a single outfall at the San Joaquin River (up to 30 percent of the peak discharge rate) once the first flush event has been treated. After the rain event is over, the pumps will continue to direct water to the river; however, if the San Joaquin River rises to a base flood level of 21.0 feet, the pumps will shut off until the water level in the river subsides. More information can be obtained from the Drainage Plan.

The storm drain lines in each individual residential street in Mossdale Landing West will drain towards the main line in Towne Centre Drive, which crosses River Islands Parkway and connects to an existing main near the intersection of Village Avenue. Water will then travel via gravity to the existing pump station located in the southwest corner of the Mossdale Landing Community Park, which will eventually pump the water into the San Joaquin River. Upgrades to the existing pump and storm drain system will be determined.

If an interim storm drain solution is required, a temporary detention basin can be constructed near the southern border of the site to hold water until it can be slowly released to enter the existing storm drain system.

In order to meet the requirements of the NPDES General Permit for Stormwater Discharges from Small MS4s, the City has prepared a Stormwater Management Plan and adopted the 2015 Multi-Agency Post-Construction Stormwater Standards Manual. Because it is likely to undergo elevated population growth, the City must also adhere to the supplemental provisions of Attachment 4 of the General Permit, which contains design standards and receiving water restrictions that must be incorporated into the design and installation of infrastructure associated with new development. According to the General Permit, both structural and non-structural Best Management Practices (BMPs) for post-construction must be installed for any new development. Structural BMPs capture and treat the first flush runoff. Examples include grassy swales, stormwater quality basins and underground vaults. To help guarantee the proper continuing operation and maintenance of these BMPs, operations and maintenance (O&M) manuals and recommended maintenance schedules are required. Examples of non-structural BMPs include good housekeeping and employee training.

SPECIFIC PLAN

Before establishing a planned development or issuing development or building permits, the WLSP states that a Specific Plan document must be approved and adopted by the City Council. The Specific Plan provides a framework of development and Project implementation for use by the City, developers and builders, which includes street and design standards and guidelines, detailed land uses, infrastructure, site planning, architecture, landscape. The approval of the proposed Specific Plan document satisfies the requirements of the City's Specific Plan process.

VESTING TENTATIVE MAP

Also referred to as a Tentative Subdivision Map, a Vesting Tentative Map will be submitted to initiate the process of subdividing the Project site. The Vesting Tentative Map design will be governed by the Subdivision Map Act, the City of Lathrop Subdivision Ordinance, the WLSP, the Specific Plan, and the City's infrastructure master plans. The Vesting Tentative Map will be subject to review by the City's Planning Commission and approval by the Lathrop City Council.

ARCHITECTURAL DESIGN REVIEW

Architectural Design Review is a discretionary permit and will be required at the Final Map stage. The purpose of the Architectural Design Review is to confirm that the proposed plans for the Project are consistent with the policies and guidelines set forth in the WLSP and the proposed Mossdale Landing West Specific Plan. The City requires projects to meet specific standards with respect to architectural styles and signage, landscape and design themes. The Architecture Design Review discretionary permit is subject to review and approval by the City's Community Development Director.

WILLIAMSON ACT CANCELLATION

The entire Plan Area falls under the Williamson Act and will require existing contracts to go through the process of cancellation and non-renewal. Notices of non-renewal have been filed for all parcels in the Development Area. Most recently, a notice of non-renewal for the northern and southeastern portions of Assessor Parcel Number (APNs) 191-190-74 and 191-190-75 (formerly APNs 191-19-010 and -720) was filed on November 29, 2021. The Williamson Act contracts have a 10-year term that is automatically renewed each year, unless the property owner requests a non-renewal or the contract is cancelled.

Cancellation of the Williamson Act is provided in Sections 51240-51287 of the Government Code. The state law requires those who wish for non-renewal, to file a Notice of Non-Renewal signifying intent to not renew the contract and file a petition for cancellation with the Lathrop City Council. The Lathrop City Council must find that the cancellation is consistent with the purposes of the Williamson Act and furthers public interest to approve the cancellation. Once approved, the land may continue to be used for agricultural purposes up until the development of land requires discontinuation.

GENERAL PLAN LAND USE DESIGNATIONS AND ZONING

The Plan Area is designated as Low Density Residential (LD) by the City's General Plan Land Use Map (Figure 2.0-10) and is zoned as RL-MV (Low Density Residential, Mossdale Village Combining District) and P-MV (Public Schools Parks Open Space, Mossdale Village Combining District) by the City's Zoning Map (Figure 2.0-11).

General Plan Amendment

The proposed Project will include a General Plan Amendment from LD to LD, Park (P), and Open Space (O).

Rezone

The proposed Project will include a rezone from RL-MV and P-MV to RL-MV, P-MV (Park, Mossdale Village Combining District), and OS-MV (Open Space, Mossdale Village Combining District).

2.4 USES OF THE EIR AND REQUIRED AGENCY APPROVALS

This EIR may be used for the following direct and indirect approvals and permits associated with adoption and implementation of the proposed Project.

CITY OF LATHROP

The City of Lathrop will be the Lead Agency for the proposed Project, pursuant to the State Guidelines for Implementation of CEQA, Section 15050.

If the City Council certifies the EIR in accordance with CEQA requirements, the City may use the EIR to support the following actions:

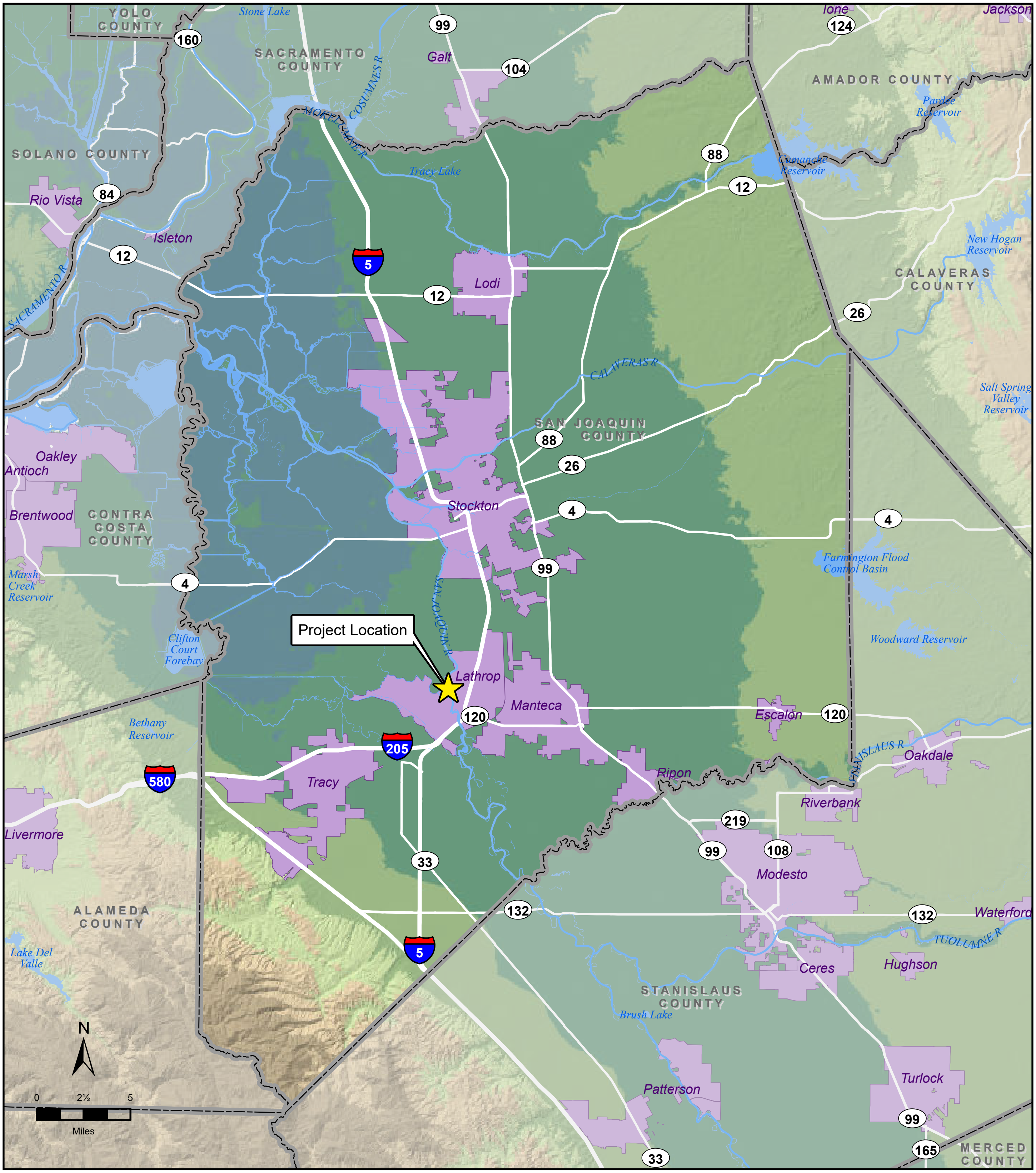
- Certification of the EIR;
- Adoption of the Mitigation Monitoring and Reporting Program;
- A General Plan Amendment to update the City of Lathrop General Plan designation from LD to LD, P, and O;
- A rezone from RL-MV and P-MV to RL-MV, P-MV, and OS-MV;
- A Specific Plan approval;
- Development Agreement;
- Approval of a Code Text Amendment to the Lathrop Municipal Code;
- A Vesting Tentative Map approval;
    - Williamson Act cancellation;
    - Approval of development agreement between the applicant and the City;
    - Improvement plan approval; and
    - Project CEQA approval.

OTHER GOVERNMENTAL AGENCY APPROVALS

The following agencies may be required to issue permits or approve certain aspects of the proposed Project. Other governmental agencies that may require approvals in connection with the Project include, but are not limited to, the following:

- Regional Water Quality Control Board (RWQCB) – Construction activities would be required to be covered under the National Pollution Discharge Elimination System (NPDES);
- RWQCB – The Storm Water Pollution Prevention Plan (SWPPP) would be required to be approved prior to construction activities pursuant to the Clean Water Act;
- San Joaquin Valley Air Pollution Control District (SJVAPCD) – Construction activities would be subject to the SJVAPCD codes and requirements.

- San Joaquin Council of Governments, Inc. – Coverage under the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP).



LEGEND

Incorporated Area

County Boundary

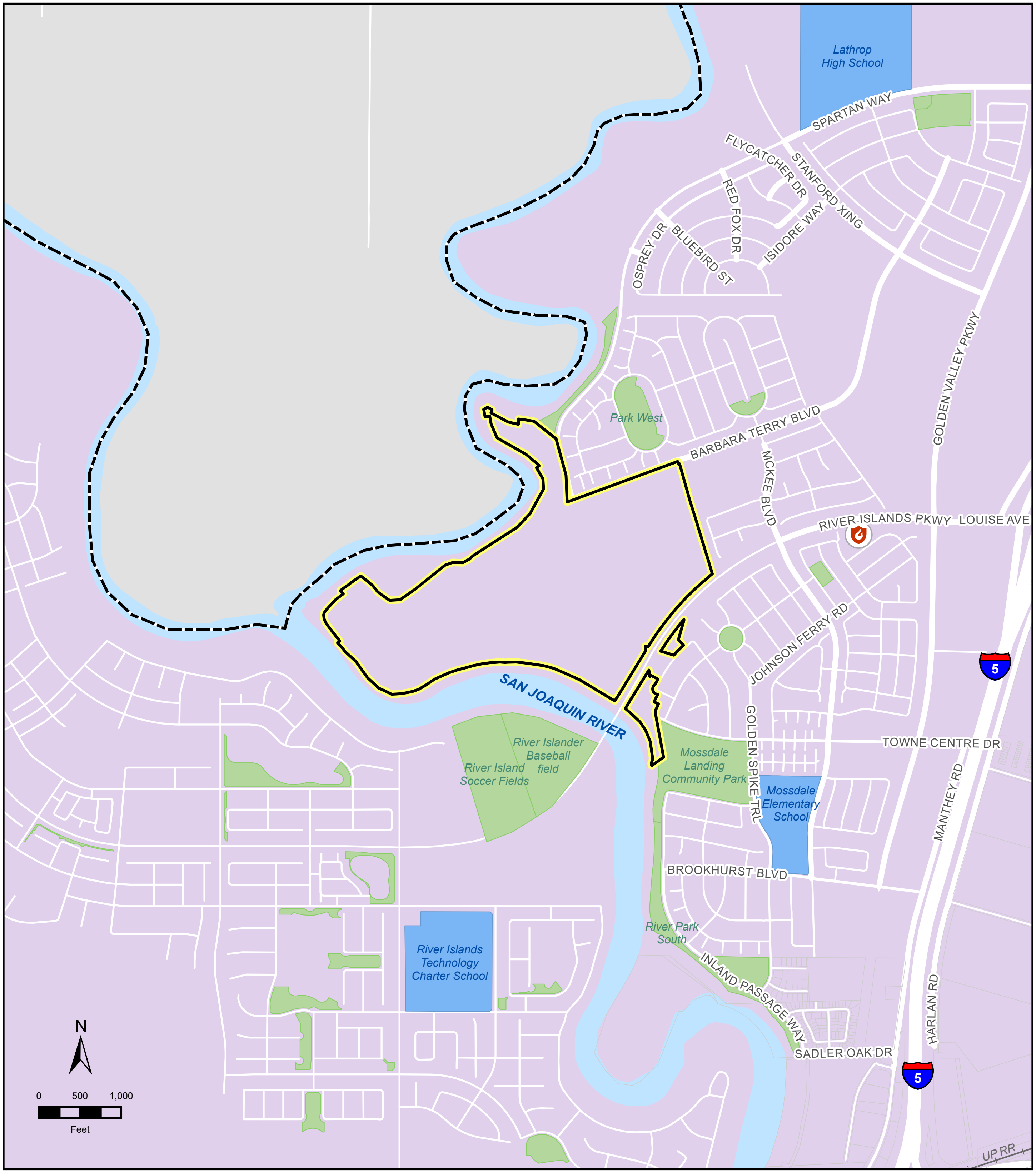
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-1. Regional Project Location

Sources: San Joaquin County GIS. Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



LEGEND

Project Location

Lathrop City Limits

Lathrop Fire Department - Station #34

Schools

Parks

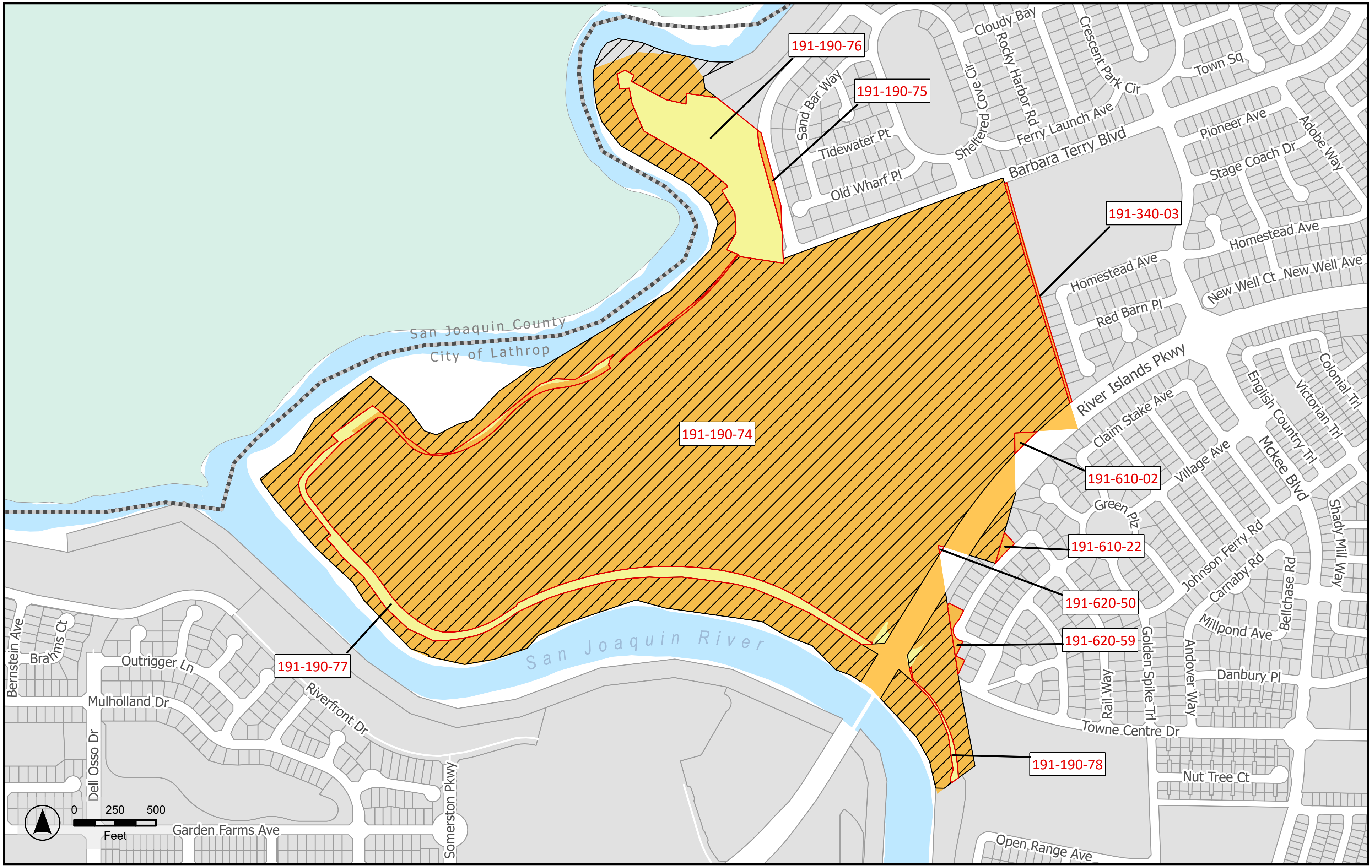
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-2. Project Vicinity

Sources: San Joaquin County GIS. Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



Legend

Lathrop City Limits

Unincorporated San Joaquin County

Other Lathrop Parcels

Parcels within the Project

Parcel 191-190-74

Other Project Parcels as Labeled

Ownership

Reclamation District #17

WSBG Investment LP

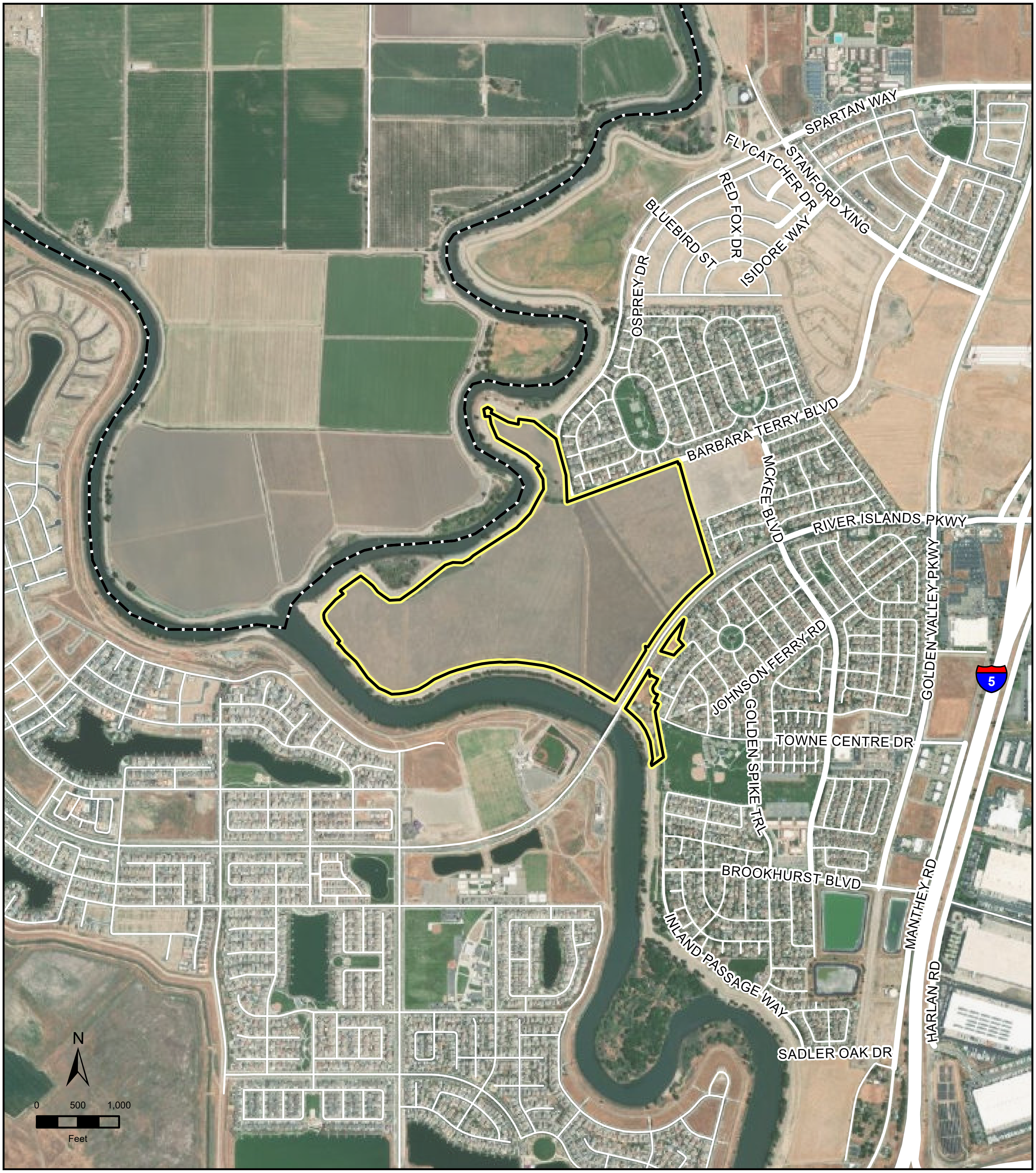
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-3. Assessor Parcels and Property Ownership

Sources: San Joaquin County GIS. Map date: December 18, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



LEGEND

Project Location

Lathrop City Limits

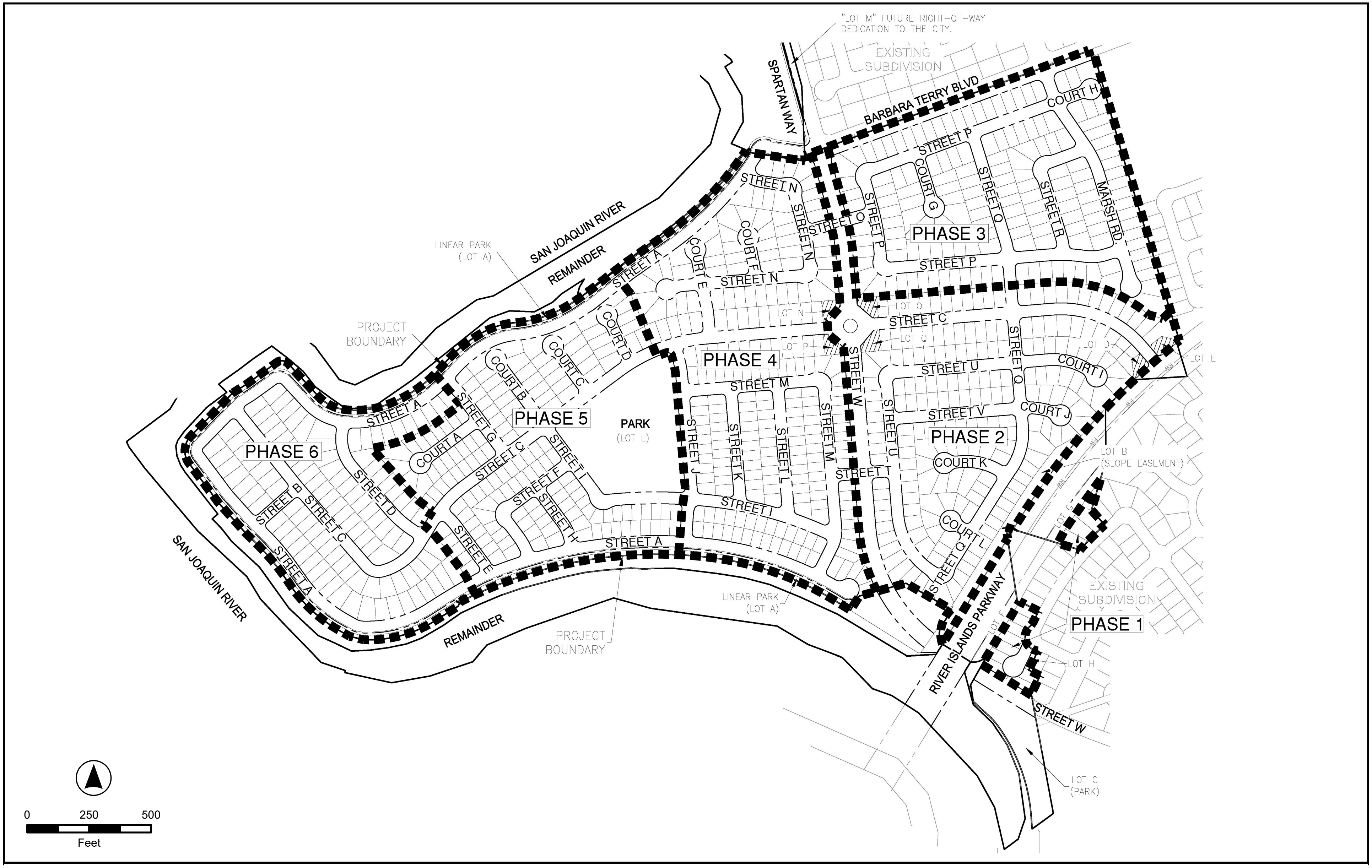
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-4. Aerial View of Project Site

Sources: San Joaquin County GIS, ArcGIS Online World Imagery Map Service(10/26/2022). Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



Legend

Phase

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-5. Phasing Map

Source: O'Dell Engineering, 7/18/2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

Legend

	42'x80' and 42'x85' Lots		50'x100' Lots
	45'x75' Lots		Open Space
	50'x80' Lots		

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-6. Project Site Map

Source: Mossdale West Urban Design Concept, City of Lathrop/O'Dell Engineering, 3/11/2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

Legend

- Arterial
- Collector
- Local Street
- Proposed Bus Stop

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-7. Circulation Map

Source: Mossdale West Urban Design Concept, City of Lathrop/O'Dell Engineering, 3/11/2022. Map date: July 23, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

Legend

Pedstrian Walkway

Multi-use Trail with Class I Bike Path

Class II Bike Lane

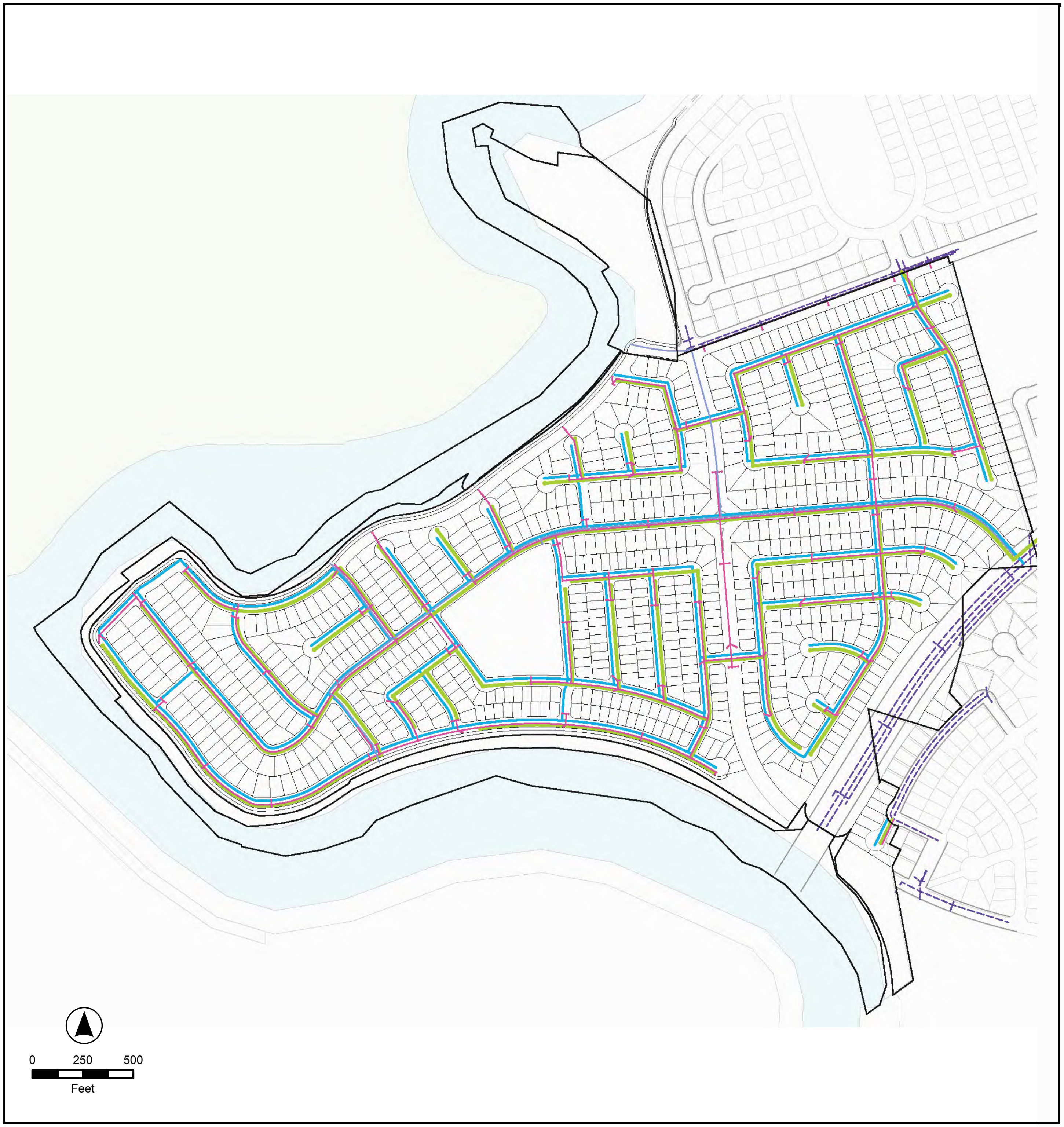
LATHROP MOSSDALE WEST

Figure 2.0-8. Bicycle and Pedestrian Map

Source: Mossdale West Urban Design Concept, City of Lathrop/O'Dell Engineering, 3/11/2022. Map date: July 23, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



Legend

- Storm Drain
- Water Main
- Sanitary Sewer
- Existing Utilities

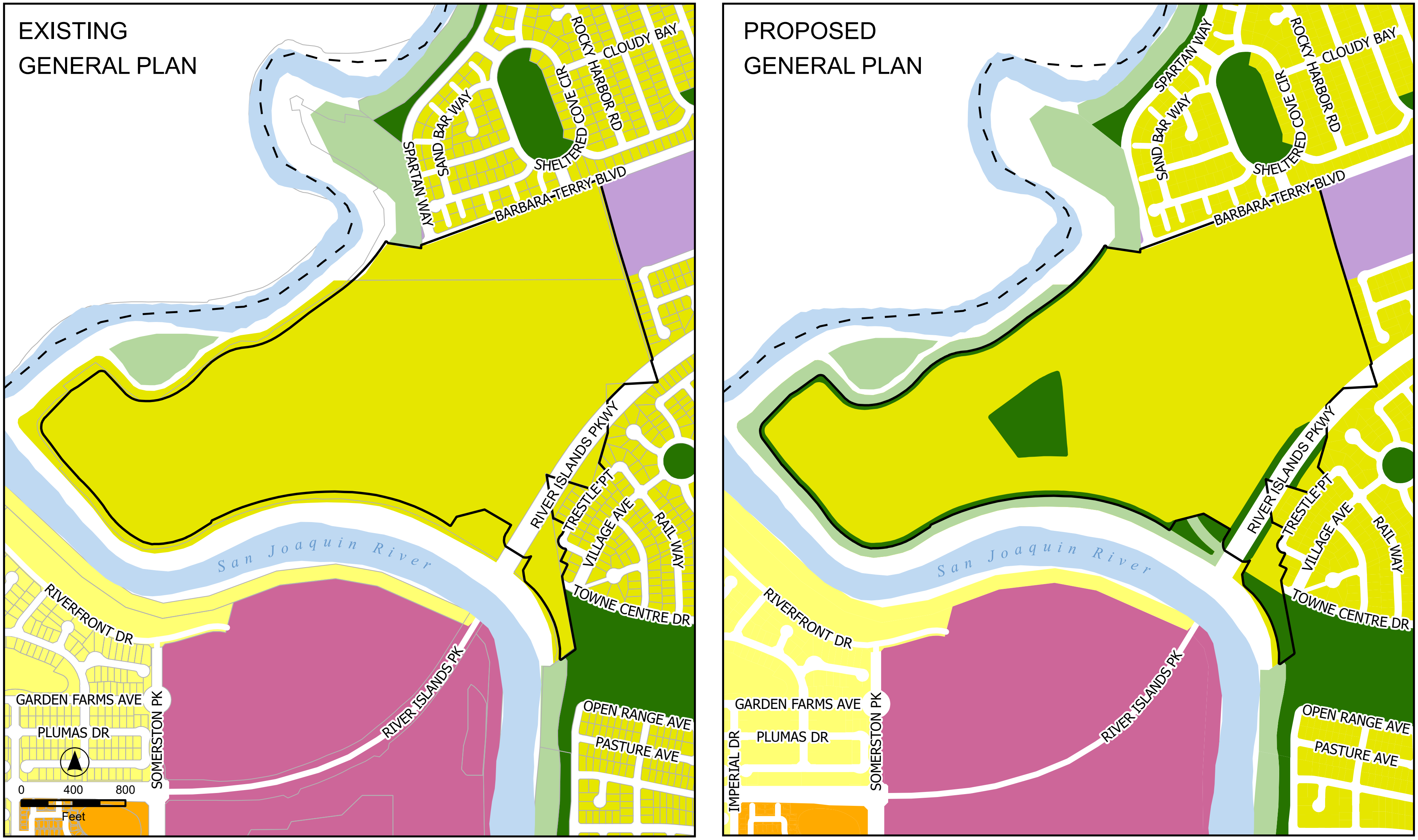
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-9. Utilities Map

Source: Mossdale West Urban Design Concept, City of Lathrop/O'Dell Engineering. Map date: March 20, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



Legend

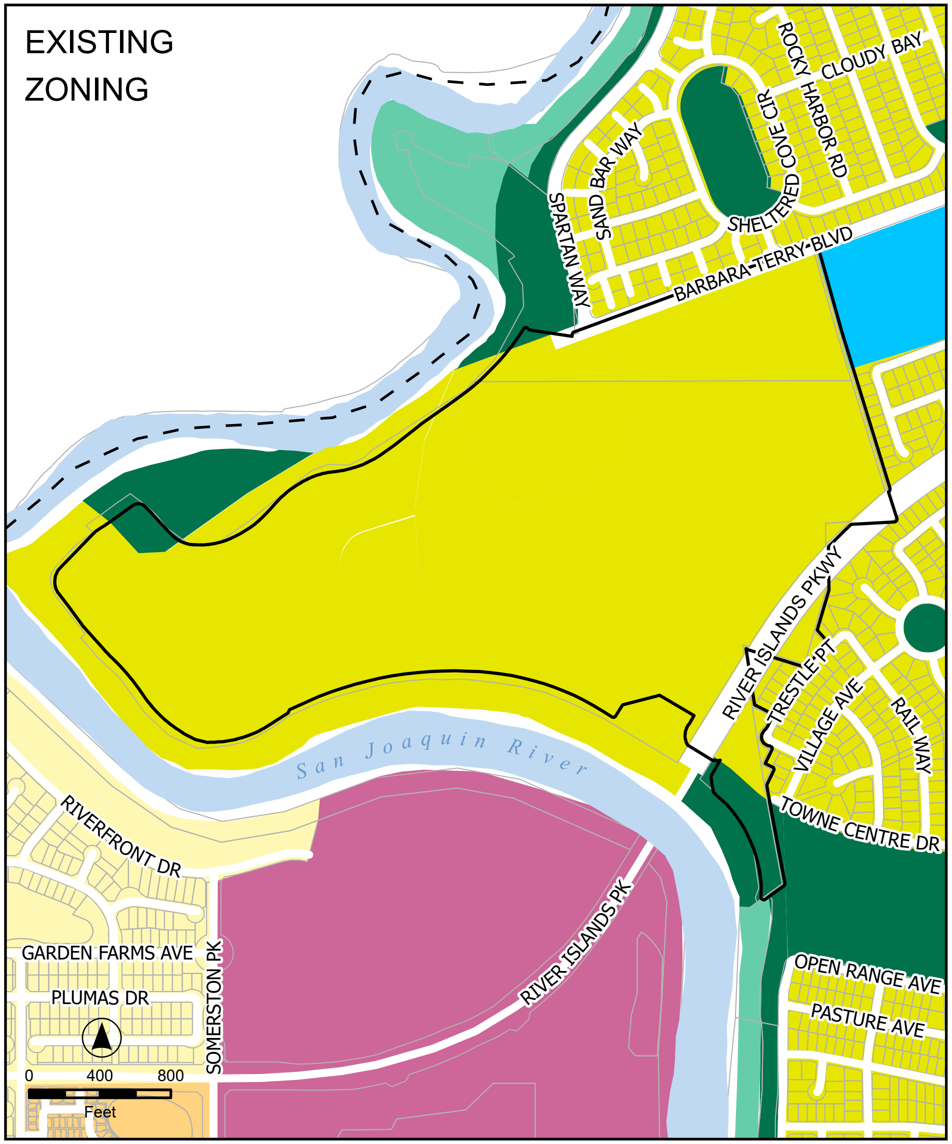
- Project Boundary
- Lathrop City Boundary
- LD: Low Density Residential (1-7 du/A)
- P/QP: Public/Quasi-Public
- P: Park
- OS: Open Space
- RL-RI: Residential Low (3-9 du/A)
- RM-RI: Residential Medium (6-20 du/A)
- MU-RI: Mixed Use

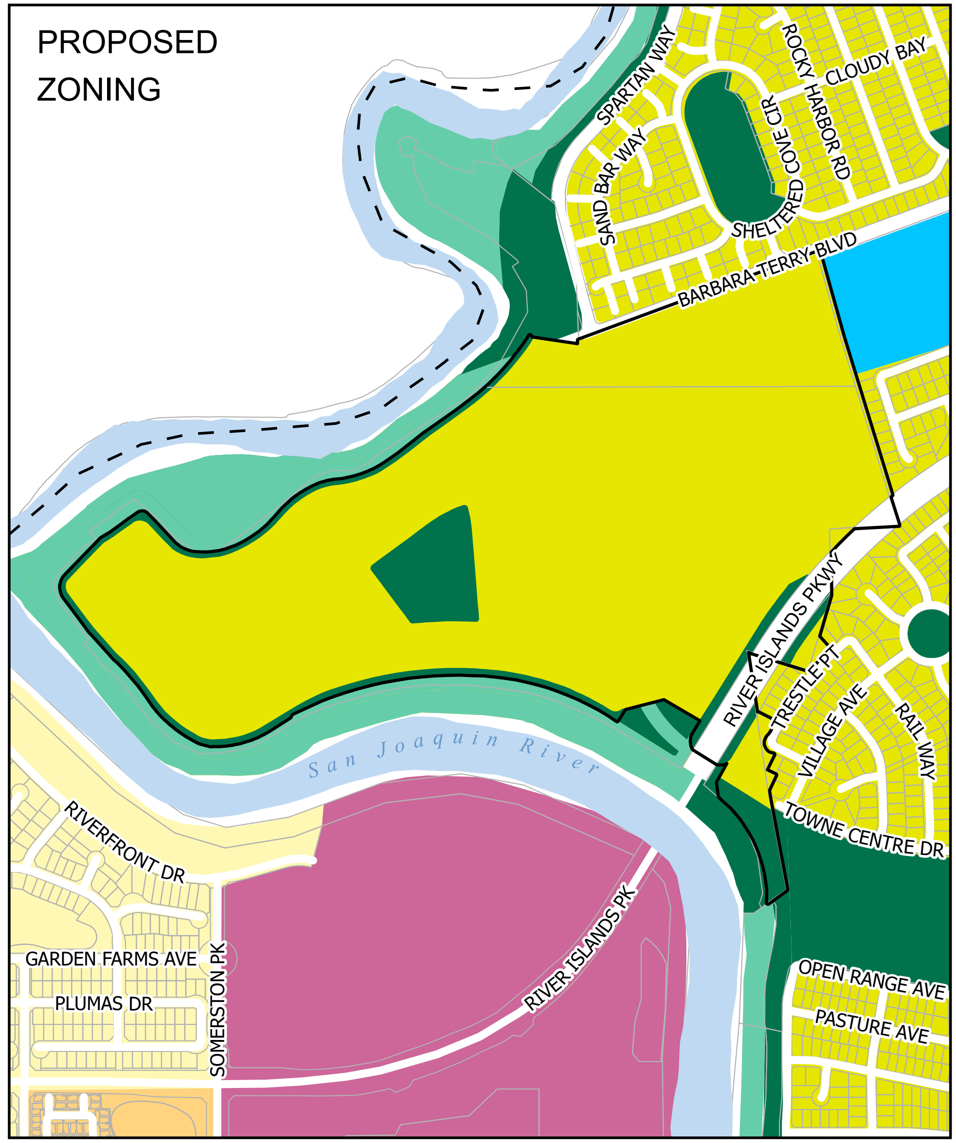
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-10. Existing and Proposed General Plan Land Use Designations

Source: City of Lathrop; San Joaquin County GIS. Map date: March 20, 2024.

This page left intentionally blank.





Legend

- Project Boundary
- Lathrop City Boundary
- OS-MV
- P-MV
- P/QP-MV
- RL-MV
- MU-RI
- RL-RI
- RM-RI

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-11. Existing and Proposed Zoning

Source: City of Lathrop; San Joaquin County GIS. Map date: March 20, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

This section provides an overview of the visual character, scenic resources, views, scenic highways, and sources of light and glare that are encountered in the Plan Area and the vicinity. This section concludes with an evaluation of the impacts. This section is based in part on the *Draft Environmental Impact Report for the Lathrop General Plan Update* (City of Lathrop, 2022) and the *City of Lathrop General Plan* (City of Lathrop, 2022).

There were no comments received during the NOP comment period that specifically address aesthetics or visual resources. Full comments received are included in Appendix A.

3.1.1 ENVIRONMENTAL SETTING

REGIONAL SCENIC RESOURCES

Visual resources are generally classified into two categories: scenic views and scenic resources. Scenic views are elements of the broader viewshed such as mountain ranges, valleys, and ridgelines. They are usually mid-ground or background elements of a viewshed that can be seen from a range of viewpoints, often along a roadway or other corridor. Scenic resources are specific features of a viewing area (or viewshed) such as trees, rock outcroppings, and historic buildings. They are specific features that act as the focal point of a viewshed and are usually foreground elements.

Aesthetically significant features occur in a diverse array of environments within the region, ranging in character from urban centers to rural agricultural lands to natural water bodies. Features of the built environment that may also have visual significance include individual or groups of structures that are distinctive due to their aesthetic, historical, social, or cultural significance or characteristics. Examples of the visually significant built environment may include bridges or overpasses, architecturally appealing buildings or groups of buildings, landscaped freeways, and a location where a historic event occurred.

SCENIC HIGHWAYS AND CORRIDORS

Scenic highways and corridors make major contributions to the quality of life enjoyed by the residents of a region. The development of community pride, the enhancement of property values, and the protection of aesthetically-pleasing open spaces reflecting a preference for the local lifestyle are all ways in which scenic corridors are valuable to residents.

Scenic highways and corridors can also strengthen the tourist industry. For many visitors, highway corridors will provide their only experience of the region. Enhancement and protection of these corridors ensures that the tourist experience continues to be a positive one and, consequently, provides support for the tourist-related activities of the region's economy.

Scenic Highways

A scenic highway is generally defined by the California Department of Transportation (Caltrans) as a public highway that traverses an area of outstanding scenic quality, containing striking views, flora, geology, or other unique natural attributes. A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

The status of a proposed state scenic highway changes from eligible to officially designated when the local governing body applies to Caltrans for scenic highway approval, adopts a Corridor Protection Program, and receives notification that the highway has been officially designated a Scenic Highway.

Only one highway section in San Joaquin County is listed as a Designated Scenic Highway by the Caltrans Scenic Highway Mapping System; the segment of Interstate 580 from Interstate 5 to State Route 205. This route traverses the edge of the Coast Range to the west and Central Valley to the east. The City of Lathrop is not visible from this roadway segment.

Scenic Corridors

A scenic corridor is the view from the road that may include a distant panorama and/or the immediate roadside area. A scenic corridor encompasses the outstanding natural features and landscapes that are considered scenic. It is the visual quality of the man-made or natural environments within a scenic corridor that are responsible for its scenic value. Commonly, the physical limits of a scenic corridor are broken down into foreground views (zero to one quarter mile) and distant views (over one quarter mile). In addition to distinct foreground and distant views, the visual quality of a scenic corridor is defined by special features, which include:

- Focal points - prominent natural or man-made features which immediately catch the eye.
- Transition areas - locations where the visual environment changes dramatically.
- Gateways - locations which mark the entrance to a community or geographic area.

The City of Lathrop General Plan does not designate any scenic corridors or viewsheds. As identified in the Open Space Element of the San Joaquin County General Plan, designated scenic routes in the county include Interstate 5 from the Sacramento County line south to Stockton. The City of Lathrop is located south of Stockton, and Lathrop is not visible from this segment of Interstate 5.

Visual Character and Other Scenic Resources Areas

The City of Lathrop’s visual character is defined by its agricultural heritage and suburban development pattern. The City is a mixture of urbanized areas with commercial, residential, and industrial uses concentrated along the Interstate 5 corridor and other major roadway corridors, including S. Harlan Road, Golden Valley Parkway, and Louise Avenue. Residential neighborhoods, including parks and schools, occupy the remainder of the City’s urbanized area east of Interstate 5 with more recent residential patterns emerging west of Interstate 5. Much of the undeveloped land within the areas surrounding the developed portion of Lathrop is predominantly farmland, including alfalfa, orchards, row crops, and pasture, and rural residential uses.

Farmland and open space, interspersed with rural residential, agricultural, and industrial uses, generally border the City to the north, south, and west. To the west, the City is bordered by agricultural land and the San Joaquin River. The City of Stockton lies to the north and the City of Manteca to the east.

Much of the undeveloped land within the City Limits and areas surrounding the urbanized portion of Lathrop is predominantly farmland, including alfalfa, orchards, row crops, and pasture. Agricultural lands have become important visual resources that contribute to the community identity of Lathrop, and the Central Valley region. Agricultural lands provide visual relief from urbanization and act as green space to nearby urban areas.

Water resources are important visual resources that draw tourists to the area for recreational opportunities, provide critical habitat, and provide for scenic areas within and surrounding urban areas. The most visually significant water body in the region is the San Joaquin River and the Old River located along the western and southern borders of the City and the Project site itself.

PLAN AREA CONTEXT

Existing Uses

As described in Chapter 2.0, *Project Description*, the Project site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The majority of the Project site is currently undeveloped and consists primarily of agricultural uses. There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River, as well as approximately six other structures associated with this residence, including a barn and shed structures.

The Plan Area is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The Plan Area topography is generally flat and ranges in elevation from approximately 14 feet to 21 feet above sea level.

There are several agricultural ditches transecting the Plan Area, with four ditches generally running north to south and one transecting the eastern portion of the Plan Area in a southwest to northeast direction. The agricultural ditches are manmade agricultural drainage facilities designed to collect irrigation and agricultural runoff from the low areas of the Plan Area.

Much of the Plan Area is active agricultural land. While this land is disturbed from its natural condition, developed agricultural land can provide visual relief to a passerby/viewer from common manmade structures and visual obstructions found in a developed environment. Agricultural lands provide a sense of openness that is common in natural environments. Throughout the year agricultural operations would result in the land evolving from an environment that appears lush with vegetation (green crops) to an environment that appears barren (recently tilled). According to the Lathrop General Plan Update EIR, agricultural lands have become important visual resources that contribute to the community identity of Lathrop, and the Central Valley region. Agricultural lands provide for visual relief form urbanized areas and act as green space to nearby urban areas.[1]

Surrounding Uses

Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed use master planned community with largely single-family residences and a central park (Park West at Mossdale Landing) in the Project vicinity to the east, and single-family residential uses to the west and south.

The Plan Area is bounded on the north by the San Joaquin River and also by Mossdale Landing, which includes Lathrop Road, Barbara Terry Boulevard, and other roads within the Mossdale Landing community. To the east, the Plan Area is bounded by Mossdale Landing, including McKee Boulevard and River Island Parkway. To the south, the Plan Area is bounded by the San Joaquin River and the River Islands development, which consists of single-family homes and undeveloped land and includes Cohen Road, Riverfront Drive, and Somerston Parkway. To the west, the Plan Area is bounded by the San Joaquin River and active agricultural land, as well as the River Islands development.

Existing Light Sources

There are minimal existing light sources in the Plan Area, as it is largely undeveloped. There are some existing light sources in the vicinity of the proposed Project site, primarily associated with Mossdale Landing, residential land uses, streetlights, and vehicle lights from nearby roadways.

3.1.2 REGULATORY SETTING

FEDERAL

There are no Federal regulations that apply to the proposed Project related to visual resources in the study area.

STATE

Caltrans California Scenic Highway Program

California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are found in the

[1] City of Lathrop, Lathrop General Plan Update Final Environmental Impact Report (SCH 2021100139), August 2022.

Streets and Highways Code, Section 260 et seq. As previously described, there are no scenic highways in the Planning Area or with views of the Planning Area.

LOCAL

City of Lathrop Municipal Code

CHAPTER 17.92, LANDSCAPING AND SCREENING STANDARDS

City of Lathrop Municipal Code Chapter 17.92, Landscaping and Screening Standards, of the City Zoning Ordinance contains several sections that regulate aesthetic or visual standards for development in the City. These include standards for landscaping of commercial and industrial developments; requirements for the contents of landscape plans; street, road, and parkway landscaping standards; requirements for a tree and shrub schedule; and planting and maintenance standards. Some of these standards would be applicable to the proposed project, including the following:

- A landscape plan is required for all new residential, commercial, and industrial developments. These plans would include landscape materials, trees, shrubs, groundcover, turf, etc.
- Parking lots located on the proposed project site shall include a landscape strip buffer installed continuously along the property line.
- All outside storage areas shall be screened so as not to be visible from adjacent properties and public rights-of-way. Screening shall be a minimum of six feet in height, and consist of a solid material. Outside storage is not permitted in front or street side yards, or in front of structures.
- Roof mounted mechanical equipment, tanks, ventilating fans and similar equipment shall be screened from the view of adjacent properties and public rights-of-way at grade. The required screens shall be architecturally compatible with the building or structure on which they are used. All streets, roads, and parkways within the City shall meet the following standards:
- In residential, commercial and industrial zones, trees shall be planted in accordance with the landscape and screening standards. In addition, the following requirements shall apply:
    - Trees shall be planted between four feet and ten feet from a public right-of-way. Trees should also be a minimum of ten feet from any driveway.
    - Trees planted on street frontages where noise attenuation is required shall be planted in a minimum five-foot landscape strip or in tree wells. Each tree shall be spaced no farther than 20 feet apart.

SECTION 17.100, SITE PLAN REVIEW

Section 17.100, Site Plan Review, of the City Zoning Ordinance contains sections that requires, during site plan review, proposed developed are reviewed in order to ensure building height; landscaping, setbacks, and lighting to be proposed to limit impact to adjoining properties.

SECTION 17.84.100, MASTER SIGNAGE PLANS

Section 17.84.100, Master Signage Plans, implements the City's Sign Design Program or master signage plans. The section provides a process for community development director review and decision related to requests for signs for multi-tenant projects. The intent is to allow the integration of a project's signs with the design of the structures to achieve a unified architectural design and to approve common sign regulations for multi-tenant projects.

City of Lathrop General Plan

The City of Lathrop General Plan contains the following policies and actions that are relevant to aesthetics:

POLICIES: RECREATION AND RESOURCES ELEMENT

Policy RR-2.1 Open Space Boundaries. Maintain existing open space lands within the city by carefully considering the impact of new development in established open space areas.

Policy RR-2.2 Regional Partners. Coordinate with regional partners to maintain and preserve open space areas under overlapping jurisdiction or within nearby communities to protect all local and regional opportunities for recreation available to Lathrop residents.

Policy RR-2.3 Scenic Resources. Protect the city's scenic resources, including scenic corridors along roads and views of the hillsides, waterways, and other significant natural features, to the extent practical.

POLICIES: LAND USE ELEMENT

Policy LU-5.1 Require new development to be compatible and complementary to existing development. Where appropriate and feasible, promote connections between neighborhoods and services and facilities.

Policy LU-5.3 Require that new residential development be designed to protect residents from potential conflicts with adjacent land uses, and other features including rail corridors, and high- volume roadways.

Policy LU-5.6 In considering land use change requests, consider factors such as compatibility with surrounding uses in terms of privacy, noise, and changes in traffic levels.

Action LU-5.a Through the development review process, screen development proposals for land use and transportation network compatibility with existing surrounding or abutting development or neighborhoods.

Action LU-5.b Through the development review process, analyze land use compatibility and require adequate buffers and/or architectural enhancements to protect sensitive receptors from intrusion of development activities that may cause unwanted nuisances and health risks.

Policy LU-7.1 Encourage San Joaquin County to retain existing agricultural land use designations in areas outside of the Lathrop SOI.

Policy LU-7.2 Support the continuation of agricultural operations and activities on lands adjacent to the SOI and within the City's Area of Influence.

Policy LU-7.3 Allow and support the continuation of agricultural operations on lands within the City limits which are designed for urban uses until such time as urban development is proposed for the land.

Policy LU-7.4 Ensure that new urban uses which are proposed adjacent to lands designated for agricultural uses include adequate buffers to reduce potential land use conflicts and nuisance impacts to sensitive receptors.

Action LU-7.a Continue to implement the City's Agricultural Land Preservation Ordinance in order to protect existing agricultural operations from nuisance complaints, and to reduce impacts to future sensitive receptors proposed in close proximity to agricultural operations.

Action LU-7.b Consider requiring buffering features between new urban uses and commercial agricultural uses, including but not limited to, landscaping, trails, gardens, solar arrays, and open spaces.

3.1.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed Project will have a significant impact on aesthetics if it will:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings. (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with the applicable zoning and other regulations governing scenic quality; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

IMPACTS AND MITIGATION MEASURES

Impact 3.1-1: The proposed Project would not result in substantial adverse effects on scenic vistas. (Less than Significant)

DEVELOPMENT CHARACTERISTICS

Development of the proposed Project would convert the site from its existing use as primarily agricultural land to developed residential housing, including a park and open spaces uses.

Project components would include:

- Development of up to 912 residential dwelling units with associated park, circulation, and utility improvements within the proposed Mossdale Landing West Specific Plan consisting of the following:
  - approximately 152.4 acres of Low-Density Residential;
  - approximately 16.5 acres of Public designated uses that are made up of:
    - approximately 5.3 acres of linear park;
    - approximately 6.2 acres of neighborhood community park;
    - approximately 2.0 acres of parkland dedication south of River Islands Parkway;
    - approximately 2.5 acres of other open space (including landscaped entries); and
    - approximately 1.4 acres of levee slope easement.
  - There will also remain 38.2 acres of undeveloped land.

The proposed Specific Plan provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units per acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the analysis is conservative as the number of units constructed at buildout would likely be closer to 829, as shown on the Vesting Tentative Subdivision Map.

SCENIC VISTAS AND RESOURCES

The Project site is not designated as a scenic vista by the City of Lathrop General Plan or the San Joaquin County General Plan. Nor does it contain any unique or distinguishing features that would qualify the site for designation as a scenic vista or scenic resource under an established program. The only scenic resource in the vicinity of the Project is the San Joaquin River and its associated environs. However, not qualifying for designation under a scenic program does not take away from the fact that Project site contains aesthetically pleasing features such as agricultural land and other natural topography. While this land is disturbed from its natural condition, developed agricultural land can provide visual relief to a passerby/viewer from common manmade structures and visual obstructions found in a developed environment. Agricultural lands provide a sense of openness that is common in natural environments. Throughout the year agricultural operations would result in the land evolving from an environment that appears lush with vegetation (green crops) to an environment that appears barren (recently tilled). The City's General Plan EIR notes that views of the agricultural lands have become important visual resources that contribute to the community identity of Lathrop, and the Central Valley region and are considered to be very important by members of the Lathrop community. Furthermore, these features are desirable to residents throughout the region, as well as visitors passing through regardless of whether they meet the criteria for scenic programs.

VISUAL CHANGES

Development of the proposed Project would result in new development adjacent to the San Joaquin River and its riparian habitat but would not result in any direct disturbance to the river or habitat, and publicly available views of the San Joaquin River would remain largely unimpaired. Development of the proposed Project would eliminate most of the orchard/agricultural areas within the Specific Plan area, but all other areas in the WSLP would remain unchanged.

Impacts related to a change in visual character are largely subjective and very difficult to quantify. People have different reactions to the visual quality of a project or a project feature, and what is considered “attractive” to one viewer may be considered “unattractive” to other viewers. The Plan Area currently consists primarily of agricultural lands, which are generally considered to provide visual relief from urban and suburban developments and help to define the character of a region. The loss of agricultural lands can have an adverse cumulative impact on the overall visual character and quality of a region. Other existing on-site uses include the Parks, trails, and Modesto Irrigation District’s canals.

PROJECT AESTHETICS

The proposed Project would include visual components that would assist in enhancing the appearance of the Specific Plan Area following site development. The Specific Plan will feature two park areas: a 6.2-acre park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park around the perimeter where the site is adjacent to the San Joaquin River. In addition, each major road right-of-way will include street trees, which will be a mixture of evergreen and deciduous varieties best suited to the climate, spaced 30-40 feet on center. Every residential lot will have a minimum of one street tree. The park spaces will include street trees, accent trees, low water use shrubs and turf. There is also a two-acre parkland dedication south of Towne Center Drive that may or may not be developed as a part of the proposed Project.

Irrigation for the landscaping will be provided as follows:

- Root watering systems for the trees;
- Rotor/rotary for turf; and
- Point source for shrubs.

The Specific Plan includes landscape architectures standards. Landscaping would be provided throughout the Plan Area, such as along roadways, paths, and parks. Tree species with invasive characteristics would be avoided. When selecting plant species, species that would minimize maintenance challenges would be preferred. Evergreen shrubs would be utilized where appropriate for screening of fences or utility structures. A mix of deciduous and evergreen tree varieties would be utilized to create interest throughout the seasons. Traditional “lawn” species would be highly discouraged in parkway strips and should be limited to parks and public open spaces for recreational use. Further, deep rooting species that use less water would be utilized when "lawn" species are used.

CONCLUSION

The proposed Project would result in the conversion of land in the Project site from a natural setting to a developed use. Nevertheless, the "attractive" aesthetics of the agricultural areas in the Project site would be visually changed in perpetuity. There are a variety of design elements, such as park areas and landscaping, in the Project site that will provide "attractive" elements to the human environment. However, as mentioned previously, there are no designated scenic vistas or resources that would be impacted. The Project site is not designated as a scenic vista by the City of Lathrop General Plan or the San Joaquin County General Plan, nor does it contain any unique or distinguishing features that would qualify the site for designation as a scenic vista or scenic resource under an established program. Therefore, while the proposed Project would permanently convert the agricultural and undeveloped uses to a developed use and would create a change in the visual characteristics of the site that is generally considered less "attractive" than the existing condition, the proposed Project site is not within or near a designated scenic vista. Implementation of the proposed Project would have a ***less than significant*** impact on a scenic vista, and no mitigation is required.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.1-2: The proposed Project would not degrade the existing visual character or quality of public views of the site and its surroundings and could substantially damage scenic resources within a State Scenic Highway. (Less than Significant)

As previously discussed, there are no designated State Scenic Highways in the vicinity of the Project site. The only Officially Designated Scenic Highway in San Joaquin County is I-580 from I-5 to SR 205 located approximately 13.6 miles southwest of the Project site. Views from this route are primarily agricultural with distant views of the Coast Range. The City of Lathrop and the Project site are not visible from this roadway segment.[2]

[2] California Department of Transportation, California State Scenic Highway System Map. Available at: https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed April 2024.

There are no County designated scenic corridors, trails, or rivers located in the Project site. Additionally, there are no “eligible” highway segments in the Project vicinity that may be included in the State Scenic Highway system. While the Project would permanently convert the agricultural land to residential use, potential views of the Project site are limited due to the topography to potential views from the State Scenic Highway. Thus, implementation of the Project would not substantially damage scenic resources within a State Scenic Highway, as public views of the agricultural land from I-580 are limited; therefore, this is a ***less than significant*** impact.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.1-3 The proposed Project would not conflict with the applicable zoning and other regulations governing scenic quality. (Less than Significant)

The CEQA definition for an “Urbanized area” means a central city or a group of contiguous cities with a population of 50,000 or more, together with adjacent densely populated areas having a population density of at least 1,000 persons per square mile. In addition, to be considered an Urbanized area according to CEQA, projects must also be within the boundary of a map prepared by the U.S. Bureau of the Census which designates the area as urbanized area. According to the U.S. Bureau of the Census, the Project site is mapped and designated as urbanized area. However, the Project site is located within the City of Lathrop, which has an estimated population of approximately 28,701 people; meaning the Project site is within a non-urbanized area and subjected to applicable zoning or other regulation governing scenic quality.[3] Future development of the Project site would convert the Project site from its existing vacant state to a developed urban use.

The proposed Project would result in a land use consistent with the land use designation of the Project site. More specifically, the Project proposes the construction residential development. These improvements would be aesthetically similar to other suburban residential uses currently developed or anticipated within the immediate area and within the WSLP. The proposed residential development, in and of itself, would not substantially degrade the existing visual character or quality of the area and its surroundings, since uses would be similar to the urbanized uses near the proposed Project site. Therefore, while the Project would result in a loss of rural

[3] Unites States Census Bureau, Profile for Lathrop, California. Available at: https://data.census.gov/profile/Lathrop_city,_California?g=160XX00US0640704. Accessed April 2024.

agricultural land, it would result in the development of residential uses in an area of Lathrop currently planned for and developed with similarly scaled uses.

Overall, Project implementation would not conflict with the applicable zoning and other regulations governing scenic quality. This impact is ***less than significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.1-4: The proposed Project would not result in light and glare impacts. (Less than Significant)

Currently, there are no existing lighting sources within the Project site. Implementation of the proposed Project would introduce new sources of light and glare into the Project site. New sources of glare would occur primarily from the windshields of vehicles travelling to and from the Project site and from vehicles parked at the site. There is also the potential for reflective building materials and windows to result in increases in daytime glare.

LIGHTING

Project lighting fixtures shall be designed to reflect the appropriate scale, type and illumination of the street or area is located and shall reinforce the overall community theme. Park and open spaces may receive low level lighting such as bollard lights or pedestrian scale lighting. Collector and residential streets may receive lower pedestrian level lighting. Pole heights along collector streets should be higher than those pole heights of residential streets. Fixture types, height and locations shall be consistent throughout the project. The lighting fixture standard for collector and residential streets shall be ornamental acorn-fixture lights unless an appropriate alternative is otherwise approved by the City. Shielding devices are required on light fixtures to prevent disruption to residential units. Lighting shall match City Department of Public Works standards and specifications as provided by the manufacturer, and meet City, PG&E and State of California standards for illuminations and safety unless an appropriate alternative is otherwise approved by the City.

Existing lighting near the proposed Project includes roadway lighting from surrounding streets, residential communities, and adjacent streetlights. Under current conditions, the proposed Project has nighttime lighting associated with the existing urbanized uses to the east, roadway lighting (including from motorist vehicles), and miscellaneous lighting associated with various nearby streets. The proposed project would be subject to lighting and design guidelines that would reduce potential adverse impacts associated with light and glare to the extent feasible. The lighting guidelines require the use of cut-off type fixtures for on-site lighting to minimize visibility from adjacent areas and specifies that light fixtures will be the appropriate size and height given the activities for which they are designed, and proposed lighting would be arranged as to deflect light away from adjoining properties.

The proposed Project would be required to be consistent with the General Plan, as well as lighting and design requirements in the City of Lathrop Municipal Code Title 17. Additionally, improvements such as landscape and street lighting, are subject to Site Plan and Architectural Design Review. Design Review procedures will be conducted for the proposed Project in compliance with 17.100 and 17.104 of the Lathrop Municipal Code. The architectural design review process includes a review of the buildings for reflective materials that would cause glare, as well as lighting effects that could cause impacts to neighbors.

GLARE

Outside the City limits, there are currently minimal sources of glare, and future development will introduce new lighting in an area with relatively low existing lighting. Due to the amount of new development in a currently undeveloped area, the Project could result in a substantial increase in glare, predominantly caused by vehicles, on nearby streets. However, excessive reflective building materials would not be used on any buildings, structures, or facilities associated with the proposed Project. Furthermore, the landscaping on-site would include a variety of shade trees throughout the Project site, including large open park areas, and the perimeter of the site would be landscaped with a variety of grasses and trees. The proposed landscaping would assist in shielding glare resulting from the proposed development and glass windows. Therefore, the proposed Project is not expected to introduce significant glare that would negatively affect nearby pedestrians or motorists.

The proposed Project lighting would be required to incorporate design features, consistent with Lathrop General Plan, to minimize the effects of light and glare, and material selections aimed to limit light and glare. Implementation of the Specific Plan requirements and standards in conjunction with the Lathrop General Plan and municipal code standards for lighting would reduce potential impacts associated with nighttime lighting, light spillage onto adjacent properties, and glare to a ***less than significant*** level.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

This page intentionally left blank.

This section provides an overview of the agricultural crops in San Joaquin County and the City of Lathrop, agricultural capability of the soils in the Project site and existing site conditions. This section concludes with an evaluation of the impacts related to agricultural resources and recommendations for mitigating impacts as needed. Information in this section is derived primarily from the San Joaquin County Agricultural Report (San Joaquin County Agricultural Commissioner, 2022), the California Department of Conversation's "FMMP – Rural Land Mapping Project" (California Department of Conservation, 2022), and the Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS, 2023).

No comments on this environmental topic were received during the NOP comment period.

No forest resources are located in the Project Area, and it is not zoned for forest land. Therefore, this CEQA topic is not relevant to the proposed Project and will not be addressed further in this EIR.

3.2.1 ENVIRONMENTAL SETTING

SAN JOAQUIN COUNTY AGRICULTURE

San Joaquin County has a total land area of 1,391 square miles. The total acreage of crop land in the county is approximately 784,800 acres. The gross value of agricultural production in San Joaquin County for 2021 was $3,193,359,000 which represents a 5.34 percent increase in value of $161,955,000 over the 2020.

Table 3.2-1 lists the top nine crop commodities in San Joaquin County in 2020 and 2021.

TABLE 3.2-1: SUMMARY COMPARISON OF CROP VALUES

PRODUCT TYPE	*2020 VALUE*	*2021 VALUE*
Field Crops	$235,304,000	$236,790,000
Vegetable Crops	$260,363,000	$250,386,000
Fruit and Nut Crops	$1,603,784,000	$1,726,962,000
Nursery Products	$132,255,000	$138,155,000
Livestock and Poultry	$124,305,000	$128,628,000
Livestock and Poultry Products	$622,507,000	$654,239,000
Seed Crops	$4,090,000	$4,029,000
Apiary Products	$48,671,000	$54,045,000
Other Agriculture	$15,258,000	$15,725,000

SOURCE: SAN JOAQUIN COUNTY AGRICULTURAL REPORT, 2021.

AGRICULTURAL CAPABILITY

The California Department of Conservation Farmland Mapping and Monitoring Program identifies lands that have agriculture value and maintains a statewide map of these lands called the Important Farmlands Inventory (IFI). IFI classifies land based upon the productive capabilities of the land, rather than the mere presence of ideal soil conditions.

The suitability of soils for agricultural use is just one factor for determining the productive capabilities of land. Suitability is determined based on many characteristics, including fertility, slope, texture, drainage, depth, and salt content. A variety of classification systems have been devised by the state to categorize soil capabilities. The two most widely used systems are the Capability Classification System and the Storie Index. The Capability Classification System classifies soils from Class I to Class VIII based on their ability to support agriculture with Class I being the highest quality soil. The Storie Index considers other factors such as slope and texture to arrive at a rating. The IFI is in part based upon both of these two classification systems.

Soil Capability Classification System

The Soil Capability Classification System takes into consideration soil limitations, the risk of damage when soils are used, and the way in which soils respond to treatment. Capability classes range from Class I soils, which have few limitations for agriculture, to Class VIII soils that are unsuitable for agriculture. Generally, as the rating of the capability classification increases, yields and profits are more difficult to obtain. A general description of soil classifications, as defined by the NRCS is provided in Table 3.2-2 below.

TABLE 3.2-2: SOIL CAPABILITY CLASSIFICATION

CLASS	*DEFINITION*
I	Soils have slight limitations that restrict their use.
II	Soils have moderate limitations that restrict choice plants or that require moderate conservation practices.
III	Soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.
IV	Soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.
V	Soils are not likely to erode but have other limitations; impractical to remove that limits their use largely to pasture or range, woodland, or wildlife habitat.
VI	Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife habitat.
VII	Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife habitat.
VIII	Soils and landforms have limitations that preclude their use for commercial plans and restrict their use to recreation, wildlife habitat, water supply, or aesthetic purposes.

SOURCE: USDA SOIL CONSERVATION SERVICE.

Storie Index Rating System

The Storie Index Rating system ranks soil characteristics according to their suitability for agriculture from Grade 1 soils (80 to 100 rating) which have few or no limitations for agricultural production, to Grade 6 soils (less than 10) which are not suitable for agriculture. Under this system, soils deemed less than prime can function as prime soils when limitations such as poor drainage, slopes, or soil nutrient deficiencies are partially or entirely removed. The six grades, ranges in index rating, and definition of the grades, as defined by the NRCS, are provided below in Table 3.2-3.

TABLE 3.2-3: STORIE INDEX RATING SYSTEM

GRADE	*INDEX RATING*	*DEFINITION*
1	80 – 100	Few limitations that restrict their use for crops
2	60 – 80	Suitable for most crops, but have minor limitations that narrow the choice of crops and have a few special management needs
3	40 – 60	Suited to a few crops or to special crops and require special management
4	20 – 40	If used for crops, severely limited and require special management
5	10 – 20	Not suited for cultivated crops, but can be used for pasture and range
6	Less than 10	Soil and land types generally not suited to farming

SOURCE: USDA SOIL CONSERVATION SERVICE, SOIL SURVEY OF YOLO COUNTY, CALIFORNIA, 1972.

In addition to soil suitability, other factors for determining the agricultural value of land include whether soils are irrigated, the depth of soil, water-holding capacity, and physical and chemical characteristics. Areas considered to have the greatest agricultural potential are designated as Prime Farmland or Farmland of Statewide Importance.

Important Farmlands

The Farmland Mapping and Monitoring Program (FMMP) is a farmland classification system administered by the California Department of Conservation. Important farmland maps are based on the Land Inventory and Monitoring criteria, which classify a land's suitability for agricultural production based on both the physical and chemical characteristics of soils, and the actual land use. The system maps five categories of agricultural land, which include important farmlands (prime farmland, farmland of statewide importance, unique farmland, and farmland of local importance) and grazing land, as well as three categories of non-agricultural land, which include urban and built-up land, other land, and water area.

IMPORTANT FARMLANDS IN SAN JOAQUIN COUNTY

Data from the Department of Conservation indicates that approximately 1,858 acres of Prime Farmland in the County was developed for other uses between 2016 and 2018, resulting in an existing total of 381,934 acres of Prime Farmland (42 percent of agricultural land). The remaining agricultural land is comprised of Farmland of Statewide Importance (9 percent), Unique Farmland (9 percent), Farmland of Local Importance (7 percent), and Grazing Land (14 percent).

The types and acreages of farmland in 2016 and 2018 are shown in Table 3.2-4.

TABLE 3.2-4: SAN JOAQUIN COUNTY FARMLANDS SUMMARY AND CHANGE BY LAND USE CATEGORY

LAND USE CATEGORY	2016-2018 ACREAGE CHANGES							
	TOTAL ACREAGE INVENTORIED				ACRES LOST	ACRES GAINED	TOTAL ACREAGE CHANGED	NET ACREAGE CHANGED
	2016		2018		(-)	(+)		
	Acres	Percent	Acres	Percent				
Prime Farmland	381,634	42%	381,984	42%	1,858	2,210	4,068	352
Farmland of Statewide Importance	82,618	9%	82,163	9%	921	466	1,387	-455
Unique Farmland	81,920	9%	85,694	9%	402	4,174	4,576	3,772
Farmland of Local Importance	68,903	8%	65,944	7%	5,507	2,547	8,054	-2,960
Important Farmland Subtotal	**615,075**	**67%**	**615,785**	**67%**	**8,688**	**9,397**	**18,085**	**709**
Grazing Land	129,760	14%	126,902	14%	2,893	37	2,930	-2,856
Agricultural Land Subtotal	**744,835**	**82%**	**742,687**	**81%**	**11,581**	**9,434**	**21,015**	**-2,147**
Urban and Built-up Land	95,329	10%	97,541	11%	121	2,332	2,453	2,211
Other Land	60,602	7%	60,987	7%	922	1,312	2,234	390
Water Area	11,836	1%	11,382	1%	680	226	906	-454
Total Area Inventoried	**912,602**	**100%**	**912,597**	**100%**	**13,304**	**13,304**	**26,608**	**0**

SOURCE: CA DEPARTMENT OF CONSERVATION, DIVISION OF LAND RESOURCE PROTECTION TABLE A-30, 2018.

EXISTING SITE CONDITIONS

The majority of the Plan Area is currently undeveloped (Figure 2.0-4). There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

The elevation of the site is generally flat and ranges from approximately 14 feet to 21 feet above mean sea level (MSL). The majority of the site is flat, with slopes existing along the San Joaquin River.

Surrounding Land Uses

Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

Important Farmland Designations

The State of California Department of Conservation FMMP and San Joaquin County GIS data were used to illustrate the farmland characteristics for the Project Area. Farmland classifications in the Project Area are summarized in Table 3.2-5, identified in Figure 3.2-1, and are described below.

TABLE 3.2-5: PROJECT SITE IMPORTANT FARMLANDS

FARMLAND TYPE	DEVELOPMENT AREA	UNDEVELOPED AREA	PROJECT SITE
Prime Farmland	137.08	6.74	**143.82**
Farmland of Statewide Importance	19.88	-	**19.88**
Farmland of Local Importance	0.01	15.04	**15.05**
Urban and Built-up Land	4.25	0.11	**4.35**
Semi-Agricultural and Rural Commercial Land	5.24	3.64	**8.87**
Nonagricultural or Natural Vegetation	0.96	32.92	**33.88**
Grand Total	**167.42**	**58.44**	**225.86**

SOURCE: FARMLAND MAPPING AND MONITORING PROGRAM; SAN JOAQUIN COUNTY GIS. MAP DATE: MAY 2, 2024.

PRIME FARMLAND

Prime Farmland is farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

The majority of the land within the Development Area, approximately 137.08 acres, is designated Prime Farmland, as shown on Figure 3.2-1. An additional 6.74 acres of Prime Farmland are located outside of the Development Area but within the Project site. Prime Farmlands are also located north and west of the Project site.

FARMLAND OF STATEWIDE IMPORTANCE

Farmland of Statewide Importance is farmland with characteristics similar to those of prime farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Approximately 19.88 acres of Farmland of Statewide Importance is located within the Development Area.

FARMLAND OF LOCAL IMPORTANCE

Farmland of Local Importance is land of importance to the local agricultural economy, as determined by the County Board of Supervisors and a local advisory committee.

Approximately 0.01 acres of Farmland of Local Importance is located in the Development Area with an additional 15.04 acres outside the Development Area but within the Project site.

URBAN AND BUILT-UP LAND

Urban and Built-Up Land includes lands occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

Approximately 4.25 acres of Urban and Built-up Land is located in the Development Area with an additional 0.11 acres outside the Development Area but within the Project site. Urban and Built-up Land is also located to the north, east, and south of the Project site.

SEMI-RURAL AGRICULTURAL AND RURAL COMMERCIAL LAND

Semi-Rural Agricultural and Rural Commercial Land includes farmsteads, agricultural storage and packing sheds, unpaved parking areas, composting facilities, equine facilities, firewood lots, and campgrounds.

Approximately 5.24 acres of Semi-Rural Agricultural and Rural Commercial Land is located in the Development Area with an additional 3.64 acres outside the Development Area but within the Project site. Semi-Rural Agricultural and Rural Commercial Land is also located to the north, east, and south of the Project site.

NONAGRICULTURAL OR NATURAL VEGETATION

Nonagricultural or Natural Vegetation includes heavily wooded, rocky/barren areas, riparian and wetland areas, grassland areas which do not qualify as Grazing Land due to their size or land management restrictions, small water bodies and recreational water ski lakes. Constructed wetlands are also included in this category.

Approximately 0.96 acres of Nonagricultural or Natural Vegetation is located in the Development Area with an additional 32.92 acres outside the Development Area but within the Project site. Nonagricultural or Natural Vegetation is also located to the north, east, and south of the Project site.

Soils and Farmland Characteristics

The Project site is underlain by Quaternary (Q) sedimentary rock deposits,[1] which is younger alluvium that consists of marine and nonmarine (continental) sedimentary rocks from the Pleistocene through Holocene Epochs that are composed of alluvium, lake, playa, and terrace deposits, both unconsolidated and semi-consolidated. This type is mostly nonmarine deposits but does include marine deposits near the coast. Review of available groundwater information provided by the California Department of Water Resources indicates that a monitored well approximately 0.25 miles north-northeast of the Project site has a well depth of 21 feet below the ground surface.[2]

[1] California Department of Conservation, 2024. Data Viewer: Quaternary Surficial Geology of Southern California. Available: https://maps.conservation.ca.gov/cgs/DataViewer/index.html. Accessed: March 10, 2024.

[2] California Department of Water Resources, 2024. SGMA Data Viewer. Available: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#currentconditions. Accessed: March 23, 2024.

A Custom Soil Survey was completed for the Development Area using the Natural Resources Conservation Service (NRCS) Web Soil Survey program. The NRCS soils map is provided in Figure 3.6-1 in Section 3.6, Geology and Soils. Table 3.2-6 identifies the type and range of soils found in the Project Area.

TABLE 3.2-6: DEVELOPMENT AREA SOILS

Unit Symbol	*Name*	*Capability Class*		*Storie Index Rating*	*Acres in Development Area*	*Percent of Total*
		Irrigated	*Non-Irrigated*			
130	Columbia fine sandy loam, drained, 0 to 2 percent slopes, MLRA 17	II	IV	Grade 2 (Good)	0.3	0.2%
148	Dello clay loam, drained, 0 to 2 percent slopes, overwashed	III	IV	Grade 3 (Fair)	19.9	11.9%
153	Egbert silty clay loam, partially drained, 0 to 2 percent slopes, MLRA 16	II	IV	Grade 3 (Fair)	26.5	15.8%
197	Merritt silty clay loam, partially drained, 0 to 2 percent slopes	II	IV	Grade 3 (Fair)	120.7	72.1%
				Total	**167.4**	**100%**

SOURCE: UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL RESOURCE CONSERVATION SERVICE, WEB SOIL SURVEY, 2024. AVAILABLE: HTTPS://WEBSOILSURVEY.NRCS.USDA.GOV/APP/WEBSOILSURVEY.ASPX. ACCESSED MARCH 11, 2024.

As shown in Table 3.2-6, the majority of soils within the Development Area consist of silty clay loam. Below is a brief description of prominent soils within the Development Area.[3]

Columbia soil series. Columbia series consists of very deep, moderately well drained soils formed in alluvium from mixed sources. These soils are on flood plains and natural levees and have slopes of 0 to 8 percent. Drainage and permeability characteristics include moderately well drained; negligible to medium runoff; moderately rapid permeability.

Dello soil series. The Dello series consist of very deep, very poorly drained soils that formed in alluvium from granitic rock sources. Dello soils are in small depressions and have slopes of 0 to 2 percent. Drainage and permeability characteristics include very poorly drained; slow runoff; rapid permeability.

Egbert soil series. The Egbert series consists of very deep, poorly drained soils formed in alluvium from mixed sources. Egbert soils are in basins of river deltas and have slopes of 0 to 5 percent. Drainage and permeability characteristics include poorly drained; very slow or slow runoff; slow permeability (sandy substratum phase has rapid permeability below a depth of 40 inches).

Merritt soil series. The Merritt series consists of very deep, poorly drained soils formed in alluvium from sedimentary rocks. Merritt soils are on recent alluvial fans and flood plains and have slopes of

[3] United States Department of Agriculture, National Resource Conservation Service, Official Soils Series Descriptions, 2024. Available: https://soilseries.sc.egov.usda.gov/osdname.aspx. Accessed March 11, 2024.

0 to 2 percent. Drainage and permeability characteristics include poorly drained; slow runoff; moderately slow permeability.

Williamson Act Contracts

Figure 3.2-2 provides a map of the active Williamson Act Lands within the Project site. According to San Joaquin County GIS data, the entire Development Area is under active Williamson Act contracts (California Land Conservation No. 73-C1-73); however, notices of non-renewal have been filed for all parcels in the Development Area. Most recently, a notice of non-renewal for the northern and southeastern portions of Assessor Parcel Number (APNs) 191-190-74 and 191-190-75 (formerly APNs 191-19-010 and -720) was filed on November 29, 2021. As discussed in the Regulatory Setting, the Williamson Act contracts have a 10-year term that is automatically renewed each year, unless the property owner requests a non-renewal or the contract is cancelled.

3.2.2 REGULATORY SETTING

FEDERAL

Farmland Protection Policy Act

The Natural Resources Conservation Service (NRCS), an agency within the U.S. Department of Agriculture, is responsible for implementation of the Farmland Protection Policy Act (FPPA). The purpose of the FPPA is to minimize Federal programs' contribution to the conversion of farmland to non-agricultural uses by ensuring that Federal programs are administered in a manner that is compatible with state, local, and private programs designed to protect farmland. The NRCS provides technical assistance to Federal agencies, state and local governments, tribes, and nonprofit organizations that desire to develop farmland protection programs and policies. The NRCS summarizes FPPA implementation in an annual report to Congress.

Farm and Ranch Lands Protection Program

The NRCS administers the Farm and Ranch Lands Protection Program (FRPP), a voluntary program aimed at keeping productive farmland in agricultural uses. Under the FRPP, the NRCS provides matching funds to state, local, or tribal government entities and nonprofit organizations with existing farmland protection programs to purchase conservation easements. According to the 1996 Farm Bill, the goal of the program is to protect between 170,000 and 340,000 acres of farmland per year. Participating landowners agree not to convert the land to non-agricultural use and retain all rights to use the property for agriculture. A conservation plan must be developed for all lands enrolled based upon the standards contained in the NRCS Field Office Technical Guide. A minimum of 30 years is required for conservation easements and priority is given to applications with perpetual easements. The NRCS provides up to 50 percent of the fair market value of the easement being conserved (NRCS, 2004). To qualify for a conservation easement, farm or ranch land must meet several criteria. The land must be:

- Prime, Unique, or other productive soil, as defined by NRCS based on factors such as water moisture regimes, available water capacity, developed irrigation water supply, soil temperature range, acid-alkali balance, water table, soil sodium content, potential for flooding, erodibility, permeability rate, rock fragment content, and soil rooting depth;
- Included in a pending offer to be managed by a nonprofit organization, state, tribal, or local farmland protection program;
- Privately owned;
- Placed under a conservation plan;
- Large enough to sustain agricultural production;
- Accessible to markets for the crop that the land produces; and
- Surrounded by parcels of land that can support long-term agricultural production.

STATE

Williamson Act

The California Land Conservation Act of 1965, commonly known as the Williamson Act, was established based on numerous State legislative findings regarding the importance of agricultural lands in an urbanizing society. Policies emanating from those findings include those that discourage premature and unnecessary conversion of agricultural land to urban uses and discourage discontinuous urban development patterns, which unnecessarily increase the costs of community services to community residents.

The Williamson Act authorizes each County to establish an agricultural preserve. Land that is within the agricultural preserve is eligible to be placed under a contract between the property owner and County that would restrict the use of the land to agriculture in exchange for a tax assessment that is based on the yearly production yield. The contracts have a 10-year term that is automatically renewed each year, unless the property owner requests a non-renewal or the contract is cancelled. The property owner can cancel a contract prior to its expiration by paying a fee of up to 12.5 percent of the property value. Williamson Act land exchanges provide a process for local entities and landowners to cancel a Williamson Act contract without paying the cancellation fee, but with the require to simultaneously dedicate a permanent agricultural conservation easement on other land. Lastly, Government Code Section 51243 includes special provisions for a land use authority to file a protest with LAFCo for contracts on parcels within one mile of a city, when they are potentially annexable by the City. A protest hearing must be held, and if the protest is upheld at the hearing, it allows for the contract to become “null and void” upon annexation of the parcel into the city.

As discussed previously, the entire Development Area is under active Williamson Act contracts; however, notices of non-renewal have been filed for all parcels in the Development Area. Figure 3.2-2 provides a map of the active Williamson Act Lands within the Project site.

The Williamson Act includes a specific provision – Government Code section 51243.5 – for dealing with “land that was within one mile of a city boundary” when a Williamson Act contract “was executed prior to January 1, 1991.” At the time a city seeks approval from a local agency formation commission (LAFCo) for the annexation of any such property, LAFCo must consider whether the city may exercise any option the city may possess to opt *not* to succeed to the rights, duties, and powers of" the affected county with respect to any Williamson Act contracts within the area.

In determining whether the city may exercise any such option, LAFCo may request, and the Department of Conservation (DOC) shall provide, advice and assistance in interpreting the requirements of section 51243.5. If DOC has concerns about the proposed action, DOC shall advise LAFCo of those concerns, whether or not LAFCo has requested DOC's advice. During the hearing on the proposed annexation, LAFCo shall address DOC's concerns and shall address whether substantial evidence shows that the city has the present option to decline to succeed to the contract(s) at issue. (Gov. Code, § 51243.5, subds. (b) & (c).)

Subdivision (e) of section 51243.5 provides as follows:

> (e) A city may exercise its option to not succeed to the rights, duties, and powers of the county under the contract if each of the following had occurred prior to January 1, 1991:
> (1) The land being annexed was within one mile of the city's boundary when the contract was executed.
> (2) The city had filed with the local agency formation commission a resolution protesting the execution of the contract.
> (3) The local agency formation commission had held a hearing to consider the city's protest to the contract.
> (4) The local agency formation commission had found that the contract would be inconsistent with the publicly desirable future use and control of the land.
> (5) The local agency formation commission had approved the city's protest.

In considering whether the city can exercise its option not to succeed to the county's rights, duties, and powers with respect to the Williamson Act contract(s) in question, LAFCo shall consider whether all of these criteria have been met. LAFCos should consult their own records to ascertain whether they have previously approved protests from the annexing city.

Farmland Security Zones

In 1998, the state Legislature established the Farmland Security Zone (FSZ) program. FSZs are similar to Williamson Act contracts, in that the intention is to protect farmland from conversion. The main difference however, is that the FSZ must be designated as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance. The term of the contract is a minimum of 20 years. The property owners are offered an incentive of greater property tax reductions when compared to the Williamson Act contract tax incentives; the incentives were developed to encourage conservation of prime farmland through FSZs. The non-renewal and cancellation procedures are similar to those for Williamson Act contracts.

The Project site and the adjacent parcels are not within the FSZ program.

California Government Code Section 560643

This section of the Government Codes defines "Prime agricultural land" as follows:

- Prime agricultural land means an area of land, whether a single parcel or contiguous parcels, that has not been developed for a use other than an agricultural use and that meets any of the following qualifications:
  - Land that qualifies, if irrigated, for rating as class I or class II in the USDA Natural Resources Conservation Service land use capability classification, whether or not land is actually irrigated, provided that irrigation is feasible.
  - Land that qualifies for rating 80 through 100 Storie Index Rating.
  - Land that supports livestock used for the production of food and fiber and that has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture in the National Range and Pasture Handbook, Revision 1, December 2003.
  - Land planted with fruit or nut-bearing trees, vines, bushes, or crops that have a nonbearing period of less than five years and that will re-turn during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than four hundred dollars ($400) per acre.
  - Land that has returned from the production of unprocessed agricultural plant products an annual gross value of not less than four hundred dollars ($400) per acre for three of the previous five calendar years.

LOCAL

City of Lathrop General Plan

POLICIES: LAND USE ELEMENT

- LU-7.1: Encourage San Joaquin County to retain existing agricultural land use designations in areas outside of the Lathrop SOI.
- LU-7.2: Support the continuation of agricultural operations and activities on lands adjacent to the SOI and within the City's Area of Influence.
- LU-7.3: Allow and support the continuation of agricultural operations on lands within the City limits which are designed for urban uses until such time as urban development is proposed for the land.
- LU-7.4: Ensure that new urban uses which are proposed adjacent to lands designated for agricultural uses include adequate buffers to reduce potential land use conflicts and nuisance impacts to sensitive receptors.

City of Lathrop Municipal Code

The City of Lathrop Right-to-Farm Ordinance (15.48.030) of the City's Agricultural Land Disclosure Statement (15.48.040) was adopted in 1991 to conserve and protect agricultural land in the City and protect agricultural landowners from nuisance complaints related to cultivation, irrigation, spraying, fertilizing, and other activities related to normal agricultural operations. Per Section 15.48.040, a disclosure statement is required whenever adjacent property is sold or building permit application is submitted, notifying the prospective buyer/applicant of adjacent agricultural land and possible discomforts and nuisance factors related to agricultural operations. The focus of the ordinance is to reduce the loss of agricultural resources in the City by clarifying the circumstances under which agricultural operations may be considered a nuisance.

Additionally, Chapter 17.128, Williamson Act Contracts, provides for the continuation, nonrenewal, or cancellation of Williamson Act contracts for properties which are annexed into the city limits. Section 17.1280.070 outlines the cancellation process. As stated, "The landowner may petition the city council for cancellation of any contract as to all or any part of the subject land. The city council may grant tentative approval for cancellation of a contract only if the findings specified in Government Code, Article 5, Section 51282, and where applicable, in Section 21081 of the Public Resources Code can be found. Any consideration of cancellation, and procedures thereof; will conform to the provisions of Government Code, Article 5, Sections 51281.1 through 51286."

Central Valley Farmland Trust

The Central Valley Farmland Trust is a private, non-profit, regional land trust working in Sacramento, San Joaquin, Stanislaus and Merced Counties of California. The organization works to preserve farmland through the purchase of agricultural conservation easements from willing landowners.

City of Lathrop Agricultural Mitigation

The City of Lathrop adopted an agricultural mitigation program in 2005, as a result of the settlement of a water transfer lawsuit against the cities of Lathrop, Manteca, and Tracy by the Sierra Club. The mitigation program adopted by the City of Lathrop required that future development pay $2,000/acre for agricultural mitigation. Half of the mitigation ($1,000/acre) will be paid to the Central Valley Farmland Trust (CVFT). The other $1,000/acre will be collected by the City of Lathrop and may be passed to the CVFT or other trust, or may be retained by the City of Lathrop to be applied to local easements or other agricultural mitigation. Per the City's Capital Facilities Fee Schedule. effective August 26, 2024, the fee is currently $3,431 per acre.

Chapter 3.40 of the City's Municipal Code implements the agricultural mitigation program. This includes mitigating the loss of productive agricultural lands converted for urban uses within the city by permanently protecting agricultural lands planned for agricultural use and by working with farmers who voluntarily wish to place conservation easements on their land with fair compensation for such easements.

These Agricultural Mitigation amounts discussed above are in addition to fees imposed as part of the San Joaquin Multi-Species Conservation Plan (SJMSCP). The adopted SJMSCP includes a commitment to spend 75% of the dollars collected on lands which would benefit agricultural resources. The SJMSCP fees are considered a separate Mitigation Fee obligation from the Agricultural Mitigation fees, but in many cases serve the same purpose. The SJMSCP is a voluntary program in lieu of conducting independent biological assessments. Most development proponents chose to comply with the SJMSCP.

San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP)

The SJMSCP provides comprehensive measures for compensation and avoidance of impacts on various biological resources, which includes ancillary benefits to agricultural resources. For instance, many of the habitat easements that are purchased or facilitated by the SJMSCP program are targeted for the protection of Swainson's hawk or other sensitive species habitat that are dependent on agricultural lands. The biological mitigation for these species through the SJMSCP includes the purchase of certain conservation easements for habitat purposes; however, the conservation easements are placed over agricultural land, such as alfalfa and row crops (not vines or orchards). As such, SJMSCP fees paid to San Joaquin Council of Governments (SJCOG) as administrator of the SJMSCP will result in the preservation of agricultural lands in perpetuity.

3.2.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed Project will have a significant impact on agricultural resources if it will:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

IMPACTS AND MITIGATION MEASURES

Impact 3.2-1: The proposed Specific Plan would result in the conversion of Farmlands, including Prime Farmland, Unique Farmland, and Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural uses. (Significant and Unavoidable)

Development of the Development Area would result in the permanent conversion of approximately 137.08 acres of Prime Farmland and 19.88 acres of Farmland of Statewide Importance, as shown on Figure 3.2-1, to nonagricultural use. It is noted that all land outside of the Development Area, but within the Project site, would not be converted to non-agricultural uses under the proposed Project. The loss of the 137.08 acres of Prime Farmland and 19.88 acres of Farmland of Statewide Importance would be a potentially significant environmental impact.

Conversion of the Development Area from largely agricultural uses to urban uses was analyzed in the City's General Plan EIR. As noted in Section 3.2 of the City's General Plan EIR, the loss of agricultural land to urbanization is considered permanent. While the City has incorporated all available mitigation for the loss of agricultural land in the form of General Plan policies and implementation actions, the extent of urban development under the General Plan inherently involves the conversion of high-quality agricultural land which is a significant and irreversible environmental impact.

As previously discussed, Chapter 3.40 of the Municipal Code establishes the City's Agricultural Mitigation Fee Program, which authorizes the collection of development impact fees to offset costs associated with the loss of productive agricultural lands converted for urban uses within the City. The City's agricultural mitigation fee program requires that future development pay the agricultural mitigation fee, currently $3,431 per acre[4], to mitigate the conversion of agricultural land to urban use. The City will use these funds to purchase conservation easements or deed restrictions on agricultural land to ensure that the land remains in agricultural use in perpetuity.

As defined in Section 3.40.050 of the Agricultural Mitigation Fee section of the City of Lathrop Municipal Code, "Agricultural land or farmland" is defined as those land areas upon which agricultural activities, uses, operations or facilities exist that contain Capability Class I, II, III or IV soils as defined by the United States Department of Agriculture Natural Resource Conservation Service. As noted in Table 3.2-6, the Development Area includes Class II and III (irrigated) and Class IV (non-irrigated) soils. Therefore, the site is considered agricultural land or farmland according to the Agricultural Mitigation Fee section of the City of Lathrop Municipal Code.

In addition to the City's agricultural mitigation fee program, the SJMSCP requires development to pay fees on a per-acre basis for impacts to agricultural lands that function as habitat for biological resources. As discussed in Section 3.4, Biological Resources, the Project site functions as biological habitat because it has been previously and actively used for agricultural use. Agricultural fields commonly have irrigation canals, ditches, and stock ponds that serve as a water source or drainage for the fields and habitat for a limited variety of plants and animals. SJCOG will then use these funds to purchase the conservation easements on agricultural and habitat lands in the Project vicinity. The compensation results in the purchase of conservation easements that are placed over agricultural land. As such, the Project fees paid to SJCOG as administrator of the SJMSCP will result in the preservation of agricultural lands in perpetuity.

The purchase of conservation easements and/or deed restrictions through the City agricultural mitigation fee program and the SJMSCP allows the landowners to retain ownership of the land and continue agricultural operations, and preserves such lands in perpetuity.

The Project site is currently designated Low Density Residential (LD) by the City of Lathrop General Plan Land Use Map. The City of Lathrop General Plan EIR identifies that the location or nature of the General Plan could result in the conversion of farmland to non-agricultural use and identified

[4] City of Lathrop. *Capital Facilities Fee Schedule, effective August 26, 2024.*

General Plan policies to support the continuation of working farmland and agricultural land to maintain agricultural use adjacent to non-agricultural uses. The EIR concluded that implementation of the General Plan would result in a less than significant impact as the General Plan includes policies which would reduce the impact of development resulting in the conversion of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance. This includes policies which encourage agricultural land uses in areas outside of Lathrop while supporting the continuation of agricultural operations and activities on lands adjacent to the SOI and with the City's Area of Interest, and within the city. The EIR noted that adherence to the policies would ensure that projects include adequate measures to buffer project uses from adjacent agricultural uses and would reduce adverse effects on neighboring agricultural uses, while supporting ongoing agricultural operations in areas within and surrounding the city.

The City of Lathrop General Plan EIR identifies that the location or nature of the General Plan could result in the conversion of farmland to non-agricultural use and identified General Plan policies to support the continuation of working farmland and agricultural land to maintain agricultural use adjacent to non-agricultural uses. However, the EIR concluded that implementation of the General Plan would result in a less than significant impact as the General Plan includes policies which would reduce the impact of development resulting in the conversion of existing farmland. This includes policies which encourage agricultural land uses in areas outside of Lathrop while supporting the continuation of agricultural operations and activities on lands adjacent to the SOI and with the City's Area of Influence, and within the city.

Mitigation Measure 3.2-1 requires participation in the City's Agricultural Mitigation Fee Program. While the implementation of this mitigation measure would assist in preserving farmland, the proposed Project would still result in the permanent conversion and loss of approximately 137.08 acres of Prime Farmland and 19.88 acres of Farmland of Statewide Importance within San Joaquin County. This is considered a ***potentially significant*** impact.

MITIGATION MEASURE(S)

Mitigation Measure 3.2-1: *Prior to the conversion of important farmland in the Development Area, the Project proponents shall participate in the City of Lathrop agricultural mitigation program and the SJMSCP by paying the established fees on a per-acre basis for the loss of important farmland. Fees paid toward the City of Lathrop's program shall include half of the mitigation fee to be paid to the Central Valley Farm Trust (CVFT). The CVFT shall use these funds to purchase conservation easements on agricultural lands to fulfill the compensatory mitigation. The other half of the mitigation fee will be collected by the City of Lathrop and may be passed to the CVFT or other trust, or may be retained by the City of Lathrop to be applied to local easements or other agricultural mitigation. Fees paid toward the SJMSCP shall be in accordance with the fees established at the time they are paid. The SJCOG shall use these funds to purchase conservation easements on agricultural habitat lands to fulfill the compensatory mitigation. Written proof of payment to SJCOG and CVFT shall be provided to the City.*

SIGNIFICANCE AFTER MITIGATION

Significant and Unavoidable.

The use of conservation easements is well-established under CEQA, though one court recently questioned their effectiveness as true mitigation. In both *Save Panoche Valley v. San Benito County* (2013) 217 Cal.App.4th 503, 528-529 (*Save Panoche Valley*) and *Masonite Corp. v. County of Mendocino* (2013) 218 Cal.App.4th 230, 237-241, the courts expressly held that the use of conservation easements to permanently preserve existing agricultural lands was a valid mitigation strategy under CEQA. In *Citizens for Open Government v. City of Lodi* (2012) 205 Cal.App.4th 296, 322-324, moreover, the court explicitly upheld as adequate mitigation a requirement that the applicant impose conservation easements on existing agricultural land at a ratio of one acre of conservation for every acre lost to development. The court rejected an attack on the EIR in that case that argued that a higher ratio of two to one should have been used. The court approvingly quoted the EIR, which had stated that “[t]he standard for California communities is the 1 for 1 ratio and is appropriate in this case.” Notably, that EIR found that the impacts to agricultural land after mitigation would be significant and unavoidable, in recognition that the easements did not replace lost lands. This EIR takes the same approach.

It is notable, too, that for many years the courts have upheld the conservation of existing wildlife habitat as a valid mitigation strategy under CEQA. (See, e.g., *Preserve Wild Santee v. City of Santee* (2012) 210 Cal.App.4th 260, 278 [loss of habitat mitigated by conservation of other habitat at a one-to-one ratio]; *California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal.App.4th 603, 610–611, 614–626 [mitigation for wetland losses by offsite preservation of two acres of existing habitat or the creation of one acre of new habitat for each acre of habitat impacted by the project]; *Endangered Habitats League, Inc. v. County of Orange* (2005) 131 Cal.App.4th 777, 794 [mitigation by “off-site preservation of similar habitat”]; *Environmental Council of Sacramento v. City of Sacramento* (2006) 142 Cal.App.4th 1018, 1038 [purchase of a half-acre for habitat reserves for every acre of development].)

More recently, however, one Court of Appeal has questioned the effectiveness of conservation easements as mitigation for the loss of agricultural land. In *King & Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 872-875 (*King*), the court held that substantial evidence did not support the conclusion in an EIR that the use of conservation easements would mitigate the loss of agricultural land to a less than significant level. The court explained that “[e]ntering into a binding agricultural conservation easement does not create new agricultural land to replace the agricultural land being converted to other uses. Instead, an agricultural conservation easement merely prevents the future conversion of the agricultural land subject to the easement. Because the easement does not offset the loss of agricultural land (in whole or in part), the easement does not reduce a project’s impact on agricultural land. The absence of any offset means a project’s significant impact on agricultural land would remain significant after the implementation of the agricultural conservation easement.” (*Id*. at p. 875.) Based on this reasoning, the court concluded that the mitigation measure in question “a does not provide effective mitigation for the conversion of agricultural land.” (*Id*. at p. 876.)

The court did recognize, however, that laws and policies other than CEQA that required the use of conservation easements were legitimate expressions of the state or local police power. "'Although the developed farmland is not replaced, an equivalent area of comparable farmland is permanently protected from a similar fate. *** The additional protection of farmland that could otherwise soon be lost to residential development promotes the County's stated objective to conserve agricultural land for agricultural uses. Further, the requirement of rough proportionality between the mitigation measure and the impact of the development project is met. For every acre of farmland permanently lost to residential development another acre of farmland is permanently protected from residential development.'" (*Id*. at p. 875, quoting *Building Industry Assn. of Central California v. County of Stanislaus* (2010) 190 Cal.App.4th 582, 592.)

Here, as explained earlier, the use of these funds to purchase conservation easements on agricultural lands to fulfill the compensatory mitigation by the Central Valley Farmland Trust is required by the City's Agricultural Mitigation Fee Program. Thus, Mitigation Measure 3.2-1 is necessary to satisfy legal obligations originating outside of CEQA. The City recognizes, however, that, as the court explained in the *King* decision, these measures do not create any new farmland to offset the loss of farmland attributable to the Project. For this reason, Impact 3.2-1 will remain ***significant and unavoidable*** after mitigation.

Regardless of the fact that Mitigation Measure 3.2-1 has been incorporated to minimize the impact to the extent feasible, there are no feasible measures that would allow for the proposed Project to be developed according to the Goals and Objectives outlined in Chapter 2.0 Project Description, while mitigating the impact to an insignificant level.

Impact 3.2-2: The proposed Project has the potential to conflict with existing zoning for agricultural use, or Williamson Act Contracts. (Significant and Unavoidable)

AGRICULTURAL ZONING

The Project Area is currently within the jurisdiction of the City of Lathrop and is designated as LD by the City's General Plan Land Use Map. As such, the Project site is not zoned for agricultural use, and land zoned for agricultural use is not located in the Project vicinity. The proposed Project would not conflict with existing zoning for agricultural use. The Project would have ***no impact*** related to conflicts with existing zoning for agricultural use.

WILLIAMSON ACT CONTRACTS

The majority of the Plan Area is currently undeveloped. There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

As noted previously, the entire Development Area is under active Williamson Act contracts; however, notices of non-renewal have been filed for all parcels in the Development Area. As discussed in the Regulatory Setting, the contracts Williamson Act contracts have a 10-year term that is automatically renewed each year, unless the property owner requests a non-renewal or the contract is cancelled. As of January 2024, the Wiliamson Act cancellation request filed for the northern and southeastern portions of APNs 191-190-74 and 191-190-75 (formerly APNs 191-19-010 and -720) on November 29, 2021 has not been approved.

As noted in Chapter 2.0, Project Description, the Project includes a Williamson Act contract cancellation request. It is anticipated that a tentative Williamson Act cancellation will be included in the entitlement requests made to the City's Planning Commission and City Council. Pursuant to Lathrop Municipal Code Section 17.1280.070, required findings specified in Government Code, Article 5, Section 51282, and where applicable, in Section 21081 of the Public Resources Code, must be made. The findings will also be included in the entitlement requests made to the City's Planning Commission and City Council.

Removal of these properties from their Williamson Act contract prior to their cancellation represents a ***potentially significant*** impact, as it would allow for the conversion of these properties to urban uses prior to the approval by the Lathrop City Council.

MITIGATION MEASURE(S)

There is no feasible mitigation available for this impact.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Significant and Unavoidable.

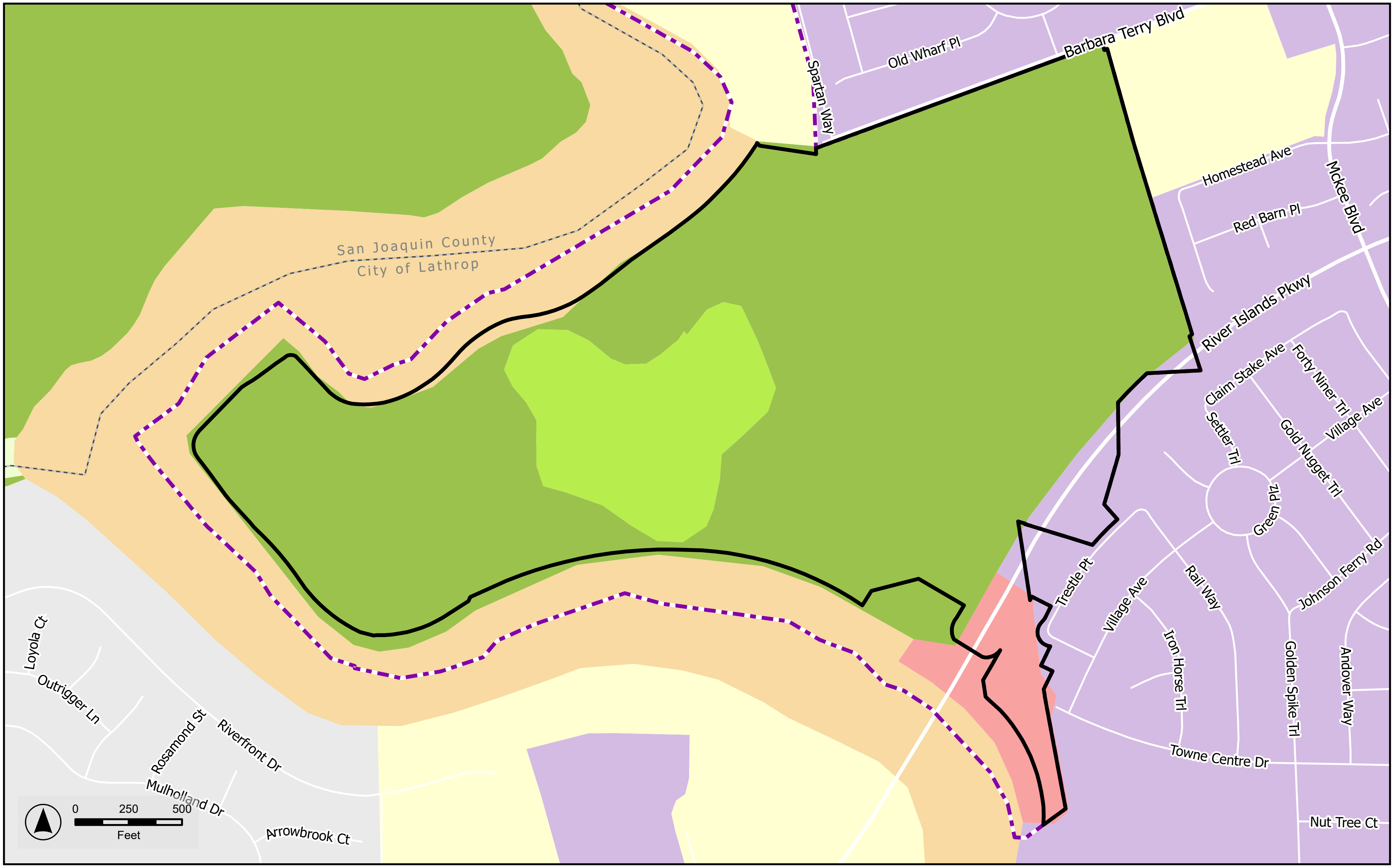
The impact of removing the property from the Williamson Act contract is taken into account when considering the impacts associated with the loss of farmland within San Joaquin County. For these reasons, implementation of the proposed Project would have a ***significant and unavoidable*** impact relative to this topic.

Impact 3.2-3: The proposed Project has the potential to result in conflicts with adjacent agricultural lands or indirectly cause conversion of agricultural lands. (Less Than Significant)

The lands adjacent to the Project site do not contain agricultural uses. There are no important farmlands located adjacent to the Project site. While Prime Farmland which contains agricultural uses is located north of the Plan Area, the Project includes a buffer along the San Joaquin River. This proposed buffer area would be designated for Open Space uses as part of the Project. This agricultural land to the north is further buffered from the Project site by the San Joaquin River. Further, the Development Area is bordered on the north and northwest by elevated levees along the San Joaquin River. These levees provide a significant buffer between the Plan Area and any agricultural uses in the vicinity. With the Lathrop City of Lathrop Right-to-Farm Ordinance (15.48.030) and the presence of both natural and manmade buffers, the potential for conflict between existing agricultural lands and adjacent uses is reduced. The notification procedures in the Ordinances serve to inform landowners and developers of non-agricultural uses of what the expectations are in the area with regard to agricultural activities and reduce complaints.

The combination of existing and proposed Project buffers and the Right-to-Farm Ordinance provide that conflicts with adjacent agricultural operations that potentially cause conversion of these lands to other uses will not occur. The proposed project would not result in the direct or indirect conversion of agricultural lands on adjacent properties, nor would it adversely impact any existing agricultural operations. Implementation of the proposed project would have a ***less than significant*** impact, and no mitigation is required.

This page intentionally left blank.



Legend

- Project Boundary/Development Area (167.42 acres)
- Mossdale West Project Area (225.86 acres)
- Prime Farmland
- Farmland of Statewide Importance
- Unique Farmland
- Farmland of Local Importance
- Nonagricultural or Natural Vegetation
- Vacant or Disturbed Land
- Semi-agricultural and Rural Commercial Land
- Urban and Built-Up Land

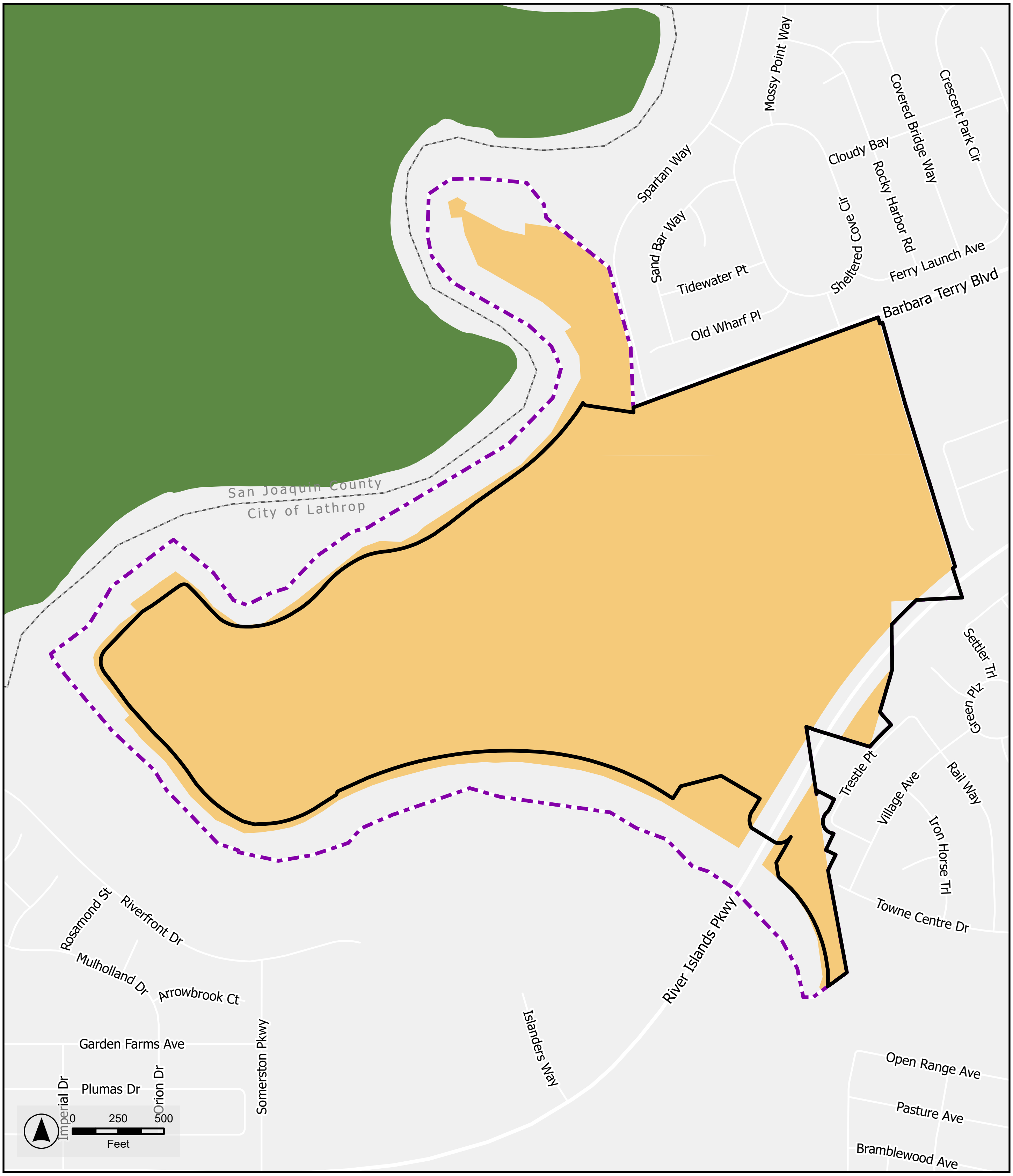
LATHROP MOSSDALE WEST

Figure 3.2-1. Important Farmlands

Sources: Farmland Mapping and Monitoring Program; San Joaquin County GIS. Map date: May 2, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page intentionally left blank.



Legend

- Project Boundary/Development Area (167.42 acres)
- Mossdale West Project Area (225.86 acres)
- Prime Agriculture Land
- Nonprime Agriculture Land
- Nonrenewal
- Farmland Security Zone
- Mixed Enrollment Agriculture Land

LATHROP MOSSDALE WEST

Figure 3.2-2. Williamson Act Contracts

Sources: Division of Land Resource Protection; San Joaquin County GIS. Map date: May 2, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page intentionally left blank.

This section describes the regional air quality, current attainment status of the air basin, local sensitive receptors, emission sources, and impacts that are likely to result from Project implementation. The analysis contained in this section is intended to be at a project-level, and covers impacts associated with the conversion of the entire Master Plan site to urban uses. Following this discussion is an assessment of consistency of the proposed Project with applicable policies and local plans. The Greenhouse Gases and Climate Change analysis is in a separate section of this document. This section is based in part on the following technical studies: *Air Quality and Land Use Handbook: A Community Health Perspective* (California Air Resources Board [CARB], 2007), *Guide for Assessing and Mitigation Air Quality Impacts* (San Joaquin Valley Air Pollution Control District [SJAVPCD], 2002), and *Guidance for Assessing and Mitigating Air Quality Impacts - 2015* (SJAVPCD, 2015). The section also includes the model results from the California Emissions Estimator Model (CalEEMod v. 2022.1).

There was one comment received during the Notice of Preparation (NOP) comment period regarding air quality. The comment letter was provided from the San Joaquin Valley Air Pollution Control District (April 24, 2024). All comments are included in Appendix A.

3.3.1 ENVIRONMENTAL SETTING

SAN JOAQUIN VALLEY AIR BASIN

The City of Lathrop (City) is in the northern portion of the San Joaquin Valley Air Basin (SJVAB). The SJVAB consists of eight counties: Fresno, Kern (western and central), Kings, Tulare, Madera, Merced, San Joaquin, and Stanislaus. Air pollution from significant activities in the SJVAB includes a variety of industrial-based sources as well as on- and off-road mobile sources. These sources, coupled with geographical and meteorological conditions unique to the area, stimulate the formation of unhealthy air.

The SJVAB is approximately 250 miles long and an average of 35 miles wide. It is bordered by the Sierra Nevada in the east, the Coast Ranges in the west, and the Tehachapi Mountains in the south. There is a slight downward elevation gradient from Bakersfield in the southeast end (elevation 408 feet) to sea level at the northwest end where the valley opens to the San Francisco Bay at the Carquinez Straits. At its northern end is the Sacramento Valley, which comprises the northern half of California’s Central Valley. The bowl-shaped topography inhibits movement of pollutants out of the valley (San Joaquin Valley Air Pollution Control District (SJVAPCD), 2015).

Climate

The SJVAB is in a Mediterranean climate zone and is influenced by a subtropical high-pressure cell most of the year. Mediterranean climates are characterized by sparse rainfall, which occurs mainly in winter. Summers are hot and dry. Summertime maximum temperatures often exceed 100°F in the valley.

The subtropical high-pressure cell is strongest during spring, summer, and fall and produces subsiding air, which can result in temperature inversions in the valley. A temperature inversion can act like a lid, inhibiting vertical mixing of the air mass at the surface. Any emissions of pollutants can be trapped below the inversion. Most of the surrounding mountains are above the normal height of summer inversions (1,500 to 3,000 feet).

Winter-time high pressure events can often last many weeks, with surface temperatures often lowering into the 30°F. During these events, fog can be present and inversions are extremely strong. These wintertime inversions can inhibit vertical mixing of pollutants to a few hundred feet (SJVAPCD, 2015).

Wind Patterns

Wind speed and direction play an important role in dispersion and transport of air pollutants. Wind at the surface and aloft can disperse pollution by mixing and transporting it to other locations.

Especially in summer, winds in the San Joaquin Valley most frequently blow from the northwest. The region's topographic features restrict air movement and channel the air mass towards the southeastern end of the valley. Marine air can flow into the basin from the San Joaquin River Delta and over Altamont Pass and Pacheco Pass, where it can flow along the axis of the valley, over the Tehachapi Pass, into the Southeast Desert Air Basin. This wind pattern contributes to transporting pollutants from the Sacramento Valley and the Bay Area into the SJVAB. Approximately 27 percent of the total emissions in the northern portion, 11 percent of total emissions in the central region, and 7 percent of total emission in the south valley of the SJVAB are attributed to air pollution transported from these two areas.[1] The Coastal Range is a barrier to air movement to the west and the high Sierra Nevada Range is a significant barrier to the east (the highest peaks in the southern Sierra Nevada reach almost halfway through the Earth's atmosphere). Many days in the winter are marked by stagnation events where winds are very weak. Transport of pollutants during winter can be very limited. A secondary but significant summer wind pattern is from the southeast and can be associated with nighttime drainage winds, prefrontal conditions, and summer monsoons.

Two significant diurnal wind cycles that occur frequently in the valley are the sea breeze and mountain-valley upslope and drainage flows. The sea breeze can accentuate the northwest wind flow, especially on summer afternoons. Nighttime drainage flows can accentuate the southeast movement of air down the valley. In the mountains during periods of weak synoptic scale winds, winds tend to be upslope during the day and downslope at night. Nighttime and drainage flows are especially pronounced during the winter when flow from the easterly direction is enhanced by nighttime cooling in the Sierra Nevada. Eddies can form in the valley wind flow and can recirculate a polluted air mass for an extended period.

Temperature

Solar radiation and temperature are particularly important in the chemistry of ozone formation. The SJVAB averages over 260 sunny days per year. Photochemical air pollution (primarily ozone) is

[1] SJVAPCD. Frequently Asked Questions, http://www.valleyair.org/general_info/frequently_asked_questions.htm#What%20is%20being%20done%20to%20improve%20ai r%20quality%20in%20the%20San%20Joaquin%20Valley, accessed August 13, 2024.

produced by the atmospheric reaction of organic substances (such as volatile organic compounds) and nitrogen dioxide under the influence of sunlight. Ozone concentrations are very dependent on the amount of solar radiation, especially during late spring, summer, and early fall. Ozone levels typically peak in the afternoon. After the sun goes down, the chemical reaction between nitrous oxide and ozone begins to dominate. This reaction tends to scavenge and remove the ozone in the metropolitan areas through the early morning hours, resulting in the lowest ozone levels, possibly reaching zero at sunrise in areas with high nitrogen oxides emissions. At sunrise, nitrogen oxides tend to peak, partly due to low levels of ozone currently and due to the morning commuter vehicle emissions of nitrogen oxides.

Generally, the higher the temperature, the more ozone formed, since reaction rates increase with temperature. However, extremely hot temperatures can “lift” or “break” the inversion layer. Typically, if the inversion layer does not lift to allow the buildup of contaminants to be dispersed, the ozone levels will peak in the late afternoon. If the inversion layer breaks and the resultant afternoon winds occur, the ozone will peak in the early afternoon and decrease in the late afternoon as the contaminants are dispersed or transported out of the SJVAB.

Ozone levels are low during winter periods when there is much less sunlight to drive the photochemical reaction (SJVAPCD, 2015).

Precipitation, Humidity, and Fog

Precipitation and fog may reduce or limit some pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog can block the required solar radiation. Wet fogs can cleanse the air during winter as moisture collects on particles and deposits them on the ground. Atmospheric moisture can also increase pollution levels. In fogs with less water content, the moisture acts to form secondary ammonium nitrate particulate matter. This ammonium nitrate is part of the valley’s $PM_{2.5}$ and PM_{10} problem. The winds and unstable air conditions experienced during the passage of winter storms result in periods of low pollutant concentrations and excellent visibility. Between winter storms, high pressure and light winds allow cold moist air to pool on the SJVAB floor. This creates strong low-level temperature inversions and very stable air conditions, which can lead to tule fog. Wintertime conditions favorable to fog formation are also conditions favorable to high concentrations of $PM_{2.5}$ and PM_{10} (SJVAPCD, 2015).

Inversions

The vertical dispersion of air pollutants in the San Joaquin Valley can be limited by persistent temperature inversions. Air temperature in the lowest layer of the atmosphere typically decreases with altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. The height of the base of the inversion is known as the “mixing height.” This is the level to which pollutants can mix vertically. Mixing of air is minimized above and below the inversion base. The inversion base represents an abrupt density change where little air movement occurs.

Inversion layers are significant in determining pollutant concentrations. Concentration levels can be related to the amount of mixing space below the inversion. Temperature inversions that occur on the summer days are usually 2,000 to 2,500 feet above the valley floor. In winter months, overnight inversions occur 500 to 1,500 feet above the valley floor (SJVAPCD, 2015).

CRITERIA POLLUTANTS

All criteria pollutants can have human health and environmental effects at certain concentrations. The United States Environmental Protection Agency (U.S. EPA) uses six "criteria pollutants" as indicators of air quality and has established, for each of them, a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). In addition, California establishes ambient air quality standards, called California Ambient Air Quality Standards (CAAQS). California law does not require that the CAAQS be met by a specified date as is the case with NAAQS.

The ambient air quality standards for the six criteria pollutants (as shown in Table 3.3-1) are set to public health and the environment within an adequate margin of safety (as provided under Section 109 of the Federal Clean Air Act). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants, and form the scientific basis for new and revised ambient air quality standards. Principal characteristics and possible health and environmental effects from exposure to the six primary criteria pollutants generated by the Project are discussed below.

Ozone (O_3) is a photochemical oxidant and the major component of smog. While O_3 in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of O_3 at ground level are a major health and environmental concern. O_3 is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (ROG) and oxides of nitrogen (NO_x) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak O_3 levels occur typically during the warmer times of the year. Both ROGs and NO_x are emitted by transportation and industrial sources. ROGs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, paint shops and other sources using solvents. Relatedly, reactive organic compounds (ROG) are defined as the subset of ROGs that are reactive enough to contribute substantially to atmospheric photochemistry.

The reactivity of O_3 causes health problems because it damages lung tissue, reduces lung function, and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to O_3 for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms including chest pain, coughing, sneezing and pulmonary congestion.

Studies show associations between short-term ozone exposure and non-accidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths (U.S. EPA, 2024a). The concentration of ozone at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrement in forced airway volume in the most responsive individual. Although the results vary, evidence suggest that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion (U.S. EPA, 2024b). The average background level of ozone in California and Nevada is approximately 48.3 parts per billion, which represents approximately 77 percent of the total ozone in the western region of the U.S. (NASA, 2015).

In addition to human health effect, ozone has been tied to crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death. O_3 can also act as a corrosive and oxidant, resulting in property damage such as the degradation of rubber products and other materials.

Carbon monoxide (CO) is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels. Carbon monoxide is harmful because it binds to hemoglobin in the blood, reducing the ability of blood to carry oxygen. This interferes with oxygen delivery to the body's organs. The most common effects of CO exposure are fatigue, headaches, confusion, and dizziness due to inadequate oxygen delivery to the brain. For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress. Inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance. Unborn babies whose mothers experience high levels of CO exposure during pregnancy are at risk of adverse developmental effects. Exposure to CO at high concentrations can also cause fatigue, headaches, confusion, dizziness, and chest pain. There are no ecological or environmental effects to ambient CO (CARB, 2024c).

Very high levels of CO are not likely to occur outdoors. However, when CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease. These people already have a reduced ability for getting oxygenated blood to their hearts in situations where the heart needs more oxygen than usual. They are especially vulnerable to the effects of CO when exercising or under increased stress. In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain also known as angina (U.S. EPA, 2024). Such acute effects may occur under current ambient conditions for some sensitive individuals, while increases in ambient CO levels increases the risk of such incidences.

Nitrogen oxides (NO_x) is a brownish, highly reactive gas that is present in all urban atmospheres. The main effect of increased NO_2 is the increased likelihood of respiratory problems. Under ambient conditions, NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are an important precursor both to ozone (O_3) and acid rain and may affect both terrestrial and aquatic ecosystems. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly are generally at greater risk for the health effects of NO_2.

The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO_x). NO_x plays a major role, together with ROGs, in the atmospheric reactions that produce O_3. NO_x forms when fuel is burned at high temperatures. The two major emission sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

Sulfur dioxide (SO_2) is one of the multiple gaseous oxidized sulfur species and is formed during the combustion of fuels containing sulfur, primarily coal and oil. The largest anthropogenic source of SO_2 emissions in the U.S. is fossil fuel combustion at electric utilities and other industrial facilities. SO_2 is also emitted from certain manufacturing processes and mobile sources, including locomotives, large ships, and construction equipment.

SO_2 affects breathing and may aggravate existing respiratory and cardiovascular disease in high doses. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children, and the elderly. SO_2 is also a primary contributor to acid deposition, or acid rain, which causes acidification of lakes and streams and can damage trees, crops, historic buildings, and statues. In addition, sulfur compounds in the air contribute to visibility impairment in large parts of the country. This is especially noticeable in national parks. Ambient SO_2 results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills and from nonferrous smelters.

Short-term exposure to ambient SO_2 has been associated with various adverse health effects. Multiple human clinical studies, epidemiological studies, and toxicological studies support a causal relationship between short-term exposure to ambient SO_2 and respiratory morbidity. The observed health effects include decreased lung function, respiratory symptoms, and increased emergency department visits and hospitalizations for all respiratory causes. These studies further suggest that people with asthma are potentially susceptible or vulnerable to these health effects. In addition, SO_2 reacts with other air pollutants to form sulfate particles, which are constituents of fine particulate matter ($PM_{2.5}$). Inhalation exposure to $PM_{2.5}$ has been associated with various cardiovascular and respiratory health effects (U.S. EPA, 2017). Increased ambient SO_2 levels would lead to increased risk of such effects.

SO_2 emissions that lead to high concentrations of SO_2 in the air generally also lead to the formation of other sulfur oxides (SOx). SOx can react with other compounds in the atmosphere to form small particles. These particles contribute to particulate matter (PM) pollution. Small particles may penetrate deeply into the lungs and in sufficient quantity can contribute to health problems.

Particulate matter (PM) includes dust, dirt, soot, smoke, and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires, and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as SO_2 and ROGs are also considered particulate matter. PM is generally categorized based on the diameter of the particulate matter: PM_{10} is particulate matter 10 micrometers or less in diameter (known as respirable particulate matter), and $PM_{2.5}$ is particulate matter 2.5 micrometers or less in diameter (known as fine particulate matter).

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO_2) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis, and premature death. Small particulate pollution causes health impacts even at very low concentrations – indeed no threshold has been identified below which no damage to health is observed.

Respirable particulate matter (PM_{10}) consists of small particles, less than 10 microns in diameter, of dust, smoke, or droplets of liquid which penetrate the human respiratory system and cause irritation by themselves, or in combination with other gases. Particulate matter is caused primarily by dust from grading and excavation activities, from agricultural activities (as created by soil preparation activities, fertilizer and pesticide spraying, weed burning and animal husbandry), and from motor vehicles, particularly diesel-powered vehicles. PM_{10} causes a greater health risk than larger particles, since these fine particles can more easily penetrate the defenses of the human respiratory system.

$PM_{2.5}$ consists of fine particles, which are less than 2.5 microns in size. Like PM_{10}, these particles are primarily the result of combustion in motor vehicles, particularly diesel engines, as well as from industrial sources and residential/agricultural activities such as burning. It is also formed through the reaction of other pollutants. As with PM_{10}, these particulates can increase the chance of respiratory disease, and cause lung damage and cancer. In 1997, the U.S. EPA created new Federal air quality standards for $PM_{2.5}$.

Although neither the U.S. EPA nor the California air districts have provided any thresholds for ultrafine particles (UFPs) (defined as fine particles of less than 0.1 microns in size, or $PM_{0.1}$), it should be noted that such particles may have the potential for even greater health effects than PM_{10} or $PM_{2.5}$, due to their even smaller sizes. UFPs are primarily generated by motor vehicle emissions (especially from diesel engines), braking, and tire wear. Specifically, UFPs are comprised mostly of metals that are known constituents of brake pads and drums, as well as additives in motor oil. Generally, all engines can create UFPs, but especially diesel engines, and any vehicle's braking system; traffic, particularly start-and-stop, generates UFPs.[2] Recent research suggests that UFPs pose considerable health risks, similar to but tending to be more severe than PM_{10} and $PM_{2.5}$, such as increased risk of cardiovascular disease and ischemic heart disease death rates, and loss of lung

[2] Aerosol Science and Technology. 2011. Thomas A. Cahill, David E. Barnes, Nicholas J. Spada, Jonathan A. Lawton, and Thomas M. Cahill. Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003-2007. July 13, 2011.

function.[3] Furthermore, unlike diesel exhaust or other larger TAC emissions, UFPs are more persistent and do not dissipate easily over distances.[4]

The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly, and children. Particulate matter also impacts soils and damages materials and is a major cause of visibility impairment.

Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms. Studies show that every 1 microgram per cubic meter reduction in $PM_{2.5}$ results in a one percent reduction in mortality rate for individuals over 30 years old (Bay Area Air Quality Management District, 2017). Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis – and even premature death. Additionally, depending on its composition, both PM_{10} and $PM_{2.5}$ can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (U.S. EPA, 2024d).

Lead (Pb) exposure can occur through multiple pathways, including inhalation of air and ingestion of Pb in food, water, soil, or dust. Once taken into the body, lead distributes throughout the body in the blood and is accumulated in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen carrying capacity of the blood. Excessive Pb exposure can cause seizures, mental retardation and/or behavioral disorders. Low doses of Pb can lead to central nervous system damage. Recent studies have also shown that Pb may be a factor in high blood pressure and subsequent heart disease.

Lead is persistent in the environment and can be added to soils and sediments through deposition from sources of lead air pollution. Other sources of lead to ecosystems include direct discharge of waste streams to water bodies and mining. Elevated lead in the environment can result in decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates.

Lead exposure is typically associated with industrial sources; major sources of lead in the air are ore and metals processing and piston-engine aircraft operating on leaded aviation fuel. Other sources are waste incinerators, utilities, and lead-acid battery manufacturers. The highest air concentrations of lead are usually found near lead smelters. As a result of the U.S. EPA's regulatory efforts, including

[3] Atmospheric Environment. 2016. Thomas A. Cahill, David E. Barnes, Leann Wuest, David Gribble, David Buscho, Roger S. Miller, Camille De la Croix. Artificial Ultra-fine Aerosol Tracers for Highway Transect Studies. April 7, 2016; Aerosol Science and Technology. 2011. Thomas A. Cahil, David E. Barnes, Earl Withycombe, & Mitchell Watnik, and DELTA Group. Very Fine and Ultrafine Metals and Ischemic Heart Disease in the California Central Valley 1: 1974-1991. July 13, 2011.

[4] Atmospheric Environment. 2016. Transition Metals in Coarse, Fine, Very Fine and Ultra-fine Particles from an Interstate Highway Transect Near Detroit. September 12, 2016.

the removal of lead from motor vehicle gasoline, levels of lead in the air decreased by 98 percent between 1980 and 2014 (U.S. EPA, 2024e). Based on this reduction of lead in the air over this period, and since most new developments do not generate an increase in lead exposure, the health impacts of ambient lead levels are not typically monitored by the California Air Resources Board (CARB).

AMBIENT AIR QUALITY STANDARDS

Both the U.S. EPA and the CARB have established ambient air quality standards for common pollutants. These ambient air quality standards represent safe levels of contaminants that avoid specific adverse health effects associated with each pollutant.

The federal and State ambient air quality standards are summarized in Table 3.3-1 for important pollutants. The federal and State ambient standards were developed independently, although both processes attempted to avoid health-related effects. As a result, the federal and State standards differ in some cases. In general, the California standards are more stringent. This is particularly true for ozone, $PM_{2.5}$, and PM_{10}. The U.S. EPA signed a final rule for the federal ozone eight-hour standard of 0.070 ppm on October 1, 2015, and was effective as of December 28, 2015 (equivalent to the California state ambient air quality eight-hour standard for ozone).

TABLE 3.3-1: FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

POLLUTANT	*AVERAGING TIME*	*FEDERAL PRIMARY STANDARD*	*STATE STANDARD*
Ozone	1-Hour 8-Hour	-- 0.070 ppm	0.09 ppm 0.070 ppm
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	0.053 ppm 0.100 ppm	0.03 ppm 0.18 ppm
Sulfur Dioxide	Annual 24-Hour 1-Hour	0.03 ppm 0.14 ppm 0.075 ppm	-- 0.04 ppm 0.25 ppm
PM_{10}	Annual 24-Hour	-- 150 ug/m^3	20 ug/m^3 50 ug/m^3
$PM_{2.5}$	Annual 24-Hour	12 ug/m^3 35 ug/m^3	12 ug/m^3 --
Lead	30-Day Avg. 3-Month Avg.	-- 0.15 ug/m^3	1.5 ug/m^3 --

NOTES: PPM = PARTS PER MILLION, UG/M3 = MICROGRAMS PER CUBIC METER

SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2024.

In 1997, new national standards for fine particulate matter diameter 2.5 microns or less ($PM_{2.5}$) were adopted for 24-hour and annual averaging periods. The existing PM_{10} standards were retained, but the method and form for determining compliance with the standards were revised.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation, and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated based on risk rather than specification of safe levels of contamination.

Existing air quality concerns within San Joaquin County and the entire air basin are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles which account for 70 percent of the ozone in the region. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

Attainment Status

In accordance with the California Clean Air Act (CCAA), the CARB is required to designate areas of the State as attainment, nonattainment, or unclassified with respect to applicable standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A "nonattainment" designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria.

Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An "unclassified" designation signifies that the data does not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The U.S. EPA designates areas for ozone, carbon monoxide, and nitrogen dioxide as "does not meet the primary standards," "cannot be classified," or "better than national standards." For sulfur dioxide, areas are designated as "does not meet the primary standards," "does not meet the secondary standards," "cannot be classified," or "better than national standards." However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used.

San Joaquin County has a State designation Attainment or Unclassified for all criteria pollutants except for ozone, PM_{10} and $PM_{2.5}$. San Joaquin County has a national designation of either Unclassified or Attainment for all criteria pollutants except for Ozone and $PM_{2.5}$. Table 3.3-2 presents the state and nation attainment status for San Joaquin County.

TABLE 3.3-2: STATE AND NATIONAL ATTAINMENT STATUS IN SAN JOAQUIN COUNTY

CRITERIA POLLUTANTS	*STATE DESIGNATIONS*	*NATIONAL DESIGNATIONS*
Ozone (O_3)	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment	Unclassified/Attainment
Nitrogen Dioxide (NO_2)	Attainment	Unclassified/Attainment
Sulfur Dioxide (SO_2)	Attainment	Unclassified/Attainment
Sulfates	Attainment	
Lead	Attainment	Unclassified/Attainment
Hydrogen Sulfide	Unclassified	
Visibility Reducing Particles	Unclassified	

SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2023.

San Joaquin County Air Quality Monitoring

The SJVAPCD and the CARB maintain air quality monitoring sites throughout San Joaquin County that collect data for ozone, $PM_{2.5}$, and PM_{10}. Data for PM10 and PM2.5 was not available for the county as a whole; therefore, data for the Manteca-530 Fishback Road monitoring site was provided for those pollutants (this monitoring site location is the monitoring site closest to the Project site with recent data). It is important to note that while the State retains the one-hour standard, the federal ozone 1-hour standard was revoked by the U.S. EPA and is no longer applicable for federal standards. Data obtained for San Joaquin County between 2021 and 2023 (latest year of data available) is shown in Table 3.3-3, Table 3.3-4, and Table 3.3-5.

TABLE 3.3-3 AMBIENT AIR QUALITY MONITORING DATA SUMMARY (SAN JOAQUIN COUNTY) - OZONE

YEAR	*DAYS > STANDARD*				*1-HOUR OBSERVATIONS*			*8-HOUR AVERAGES*				*YEAR COVERAGE*	
	STATE		*NATIONAL*			*STATE*	*NAT'L*	*STATE*		*NATIONAL*			
	1-HR	*8-HR*	*1-HR*	*8-HR*	*MAX.*	*D.V.*[1]	*D.V.*[2]	*MAX.*	*D.V.*[1]	*MAX.*	*D.V.*[2]	*MIN*	*MAX*
2023	0	0	0	0	0.086	0.14	0.087	0.069	0.114	0.068	0.064	80	94
2022	1	1	1	1	0.141	0.14	0.091	0.114	0.114	0.113	0.066	96	97
2021	0	3	0	3	0.089	0.10	0.093	0.078	0.077	0.077	0.068	0	98

NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. THE NATIONAL 1-HOUR OZONE STANDARD WAS REVOKED IN JUNE 2005 AND IS NO LONGER IN EFFECT. STATISTICS RELATED TO THE REVOKED STANDARD ARE SHOWN IN ITALICS. D.V. [1] = STATE DESIGNATION VALUE. D.V. [2]= NATIONAL DESIGN VALUE.
SOURCE: CALIFORNIA AIR RESOURCES BOARD (AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM OR IADAM) AIR POLLUTION SUMMARIES.

TABLE 3.3-4: QUALITY MONITORING DATA SUMMARY (MANTECA-530 FISHBACK ROAD) – PM_{10}

YEAR	*EST. DAYS > STD.*		*ANNUAL AVERAGE*		*HIGH 24-HR AVERAGE*		*YEAR COVERAGE*
	NAT'L	*STATE*	*NAT'L*	*STATE*	*NAT'L*	*STATE*	
2023	1	32.1	25.8	26.4	191.9	194.8	0
2022	0	No data	29.2	No data	129.7	129.3	0
2021	2	No data	33.3	No data	201.9	166.6	0

NOTES: THE NATIONAL ANNUAL AVERAGE PM_{10} STANDARD WAS REVOKED IN DECEMBER 2006 AND IS NO LONGER IN EFFECT. AN EXCEEDANCE IS NOT NECESSARILY A VIOLATION. STATISTICS MAY INCLUDE DATA THAT ARE RELATED TO AN EXCEPTIONAL EVENT. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. NATIONAL STATISTICS ARE BASED ON STANDARD CONDITIONS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. ND=THERE WAS INSUFFICIENT (OR NO) DATA AVAILABLE TO DETERMINE THE VALUE.

SOURCE: CALIFORNIA AIR RESOURCES BOARD (AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM OR ADAM) AIR POLLUTION SUMMARIES.

TABLE 3.3-5 AMBIENT AIR QUALITY MONITORING DATA SUMMARY (MANTECA-530 FISHBACK ROAD) - $PM_{2.5}$

YEAR	EST. DAYS > NAT'L '06 STD.	ANNUAL AVERAGE		NAT'L ANN. STD. D.V.¹	STATE ANNUAL D.V.²	NAT'L '06 STD. 98TH PERCENTILE	NAT'L '06 24-HR STD. D.V.¹	HIGH 24-HOUR AVERAGE		YEAR COVERAGE
		NAT'L	STATE					NAT'L	STATE	
2023	3.0	7.9	7.9	9.5	8	29.5	33	38.0	38.0	100
2022	No Data	No Data	No Data	No Data	15	33.1	54	39.0	37.6	72
2021	11.3	11.7	No data	No data	15	37.4	52	58.7	57.7	100

NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. D.V. ¹= STATE DESIGNATION VALUE. D.V. ²= NATIONAL DESIGN VALUE

SOURCE: CALIFORNIA AIR RESOURCES BOARD (AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM OR ADAM) AIR POLLUTION SUMMARIES.

ODORS

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals can smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another.

It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

SENSITIVE RECEPTORS

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiorespiratory diseases. A sensitive receptor is a location where human populations, especially children, seniors, and sick persons, are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include residences, hospitals, and schools. The closest sensitive receptors to the Project site include the mixed use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

3.3.2 REGULATORY SETTING

FEDERAL

Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: NAAQS for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The U.S. EPA is responsible for administering the FCAA. The FCAA requires the U.S. EPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health (with an adequate margin of safety, including for sensitive populations such as children, the elderly, and individuals suffering from respiratory diseases), and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

NAAQS standards define clean air and represent the maximum amount of pollution that can be present in outdoor air without any harmful effects on people and the environment. Existing violations of the ozone and $PM_{2.5}$ ambient air quality standards indicate that certain individuals exposed to these pollutants may experience certain health effects, including increased incidence of cardiovascular and respiratory ailments.

NAAQS standards have been designed to accurately reflect the latest scientific knowledge and are reviewed every five years by a Clean Air Scientific Advisory Committee (CASAC), consisting of seven members appointed by the U.S. EPA Administrator. Reviewing NAAQS is a lengthy undertaking and includes the following major phases: Planning, Integrated Science Assessment (ISA), Risk/Exposure Assessment (REA), Policy Assessment (PA), and Rulemaking. The process starts with a comprehensive review of the relevant scientific literature. The literature is summarized and conclusions are presented in the ISA. Based on the ISA, U.S. EPA staff perform a risk and exposure assessment, which is summarized in the REA document. The third document, the PA, integrates the findings and conclusions of the ISA and REA into a policy context, and provides lines of reasoning that could be used to support retention or revision of the existing NAAQS, as well as several alternative standards that could be supported by the review findings. Each of these three documents are released for public comment and public peer review by the CASAC. Members of CASAC are appointed by the U.S. EPA Administrator for their expertise in one or more of the subject areas covered in the ISA. The CASAC's role is to peer review the NAAQS documents, ensure that they reflect the thinking of the scientific community, and advise the Administrator on the technical and scientific aspects of standard setting. Each document goes through two to three drafts before CASAC deems it to be final.

Although there is some variability among the health effects of the NAAQS pollutants, each has been linked to multiple adverse health effects including, among others, premature death, hospitalizations, and emergency department visits for exacerbated chronic disease, and increased symptoms such as coughing and wheezing. NAAQS standards were last revised for each of the six criteria pollutant as listed below, with detail on what aspects of NAAQS changed during the most recent update:

- Ozone: On October 1, 2015, the U.S. EPA lowered the national eight-hour standard from 0.075 ppm to 0.070 ppm, providing for a more stringent standards consistent with the current California state standard.
- CO: In 2011, the primary standards were retained from the original 1971 level, without revision. The secondary standards were revoked in 1985.
- NO_2: The national NO_2 standard was most recently revised in 2010 following an exhaustive review of new literature pointed to evidence for adverse effects in asthmatics at lower NO_2 concentrations than the existing national standard.
- SO_2: On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb.
- PM: the national annual average $PM_{2.5}$ standard was most recently revised in 2012 following an exhaustive review of new literature pointed to evidence for increased risk of premature mortality at lower $PM_{2.5}$ concentrations than the existing standard.
- Lead: The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. In 2016, the primary and secondary standards were retained.

The law recognizes the importance for each state to locally carry out the requirements of the FCAA, as special consideration of local industries, geography, housing patterns, etc. are needed to have full comprehension of the local pollution control problems. As a result, the U.S. EPA requires each state to develop a State Implementation Plan (SIP) that explains how each state will implement the FCAA within their jurisdiction. A SIP is a collection of rules and regulations that a particular state will implement to control air quality within their jurisdiction. The CARB is the state agency that is responsible for preparing the California SIP.

Transportation Conformity

Transportation conformity requirements were added to the FCAA in the 1990 amendments, and the U.S. EPA adopted implementing regulations in 1997. See §176 of the FCAA (42 U.S.C. §7506) and 40 CFR Part 93, Subpart A. Transportation conformity serves much the same purpose as general conformity: it ensures that transportation plans, transportation improvement programs, and projects that are developed, funded, or approved by the United States Department of Transportation or that are recipients of funds under the Federal Transit Act or from the Federal Highway Administration (FHWA), conform to the SIP as approved or promulgated by U.S. EPA.

Currently, transportation conformity applies in nonattainment areas and maintenance areas. Under transportation conformity, a determination of conformity with the applicable SIP must be made by the agency responsible for the proposed Project, such as the Metropolitan Planning Organization, the Council of Governments, or a federal agency. The agency making the determination is also responsible for all the requirements relating to public participation. Generally, a project will be considered in conformance if it is in the transportation improvement plan and the transportation improvement plan is incorporated in the SIP. If an action is covered under transportation conformity, it does not need to be separately evaluated under general conformity.

Transportation Control Measures

One aspect of the SIP development process is the consideration of potential control measures as a part of making progress towards clean air goals. While most SIP control measures are aimed at reducing emissions from stationary sources, some are typically created to address mobile or transportation sources. These are known as transportation control measures (TCMs). TCM strategies are designed to reduce vehicle miles traveled and trips, or vehicle idling and associated air pollution. These goals are achieved by developing attractive and convenient alternatives to single-occupant vehicle use. Examples of TCMs include ridesharing programs, transportation infrastructure improvements such as adding bicycle and carpool lanes, and expansion of public transit.

STATE

Advanced Clean Cars II

The Advanced Clean Cars II regulations reduce light-duty passenger car, pickup truck and SUV emissions starting with the 2026 model year through 2035. The regulations are two-pronged. First, it amends the Zero-emission Vehicle Regulation to require an increasing number of zero-emission vehicles, and relies on currently available advanced vehicle technologies, including battery-electric, hydrogen fuel cell electric and plug-in hybrid electric-vehicles, to meet air quality and climate change emissions standards. These amendments support Governor Newsom's 2020 Executive Order N-79-20 that requires all new passenger vehicles sold in California to be zero emissions by 2035. Second, the Low-emission Vehicle Regulations were amended to include increasingly stringent standards for gasoline cars and heavier passenger trucks to continue to reduce smog-forming emissions.

Advanced Clean Trucks

On June 25, 2020, the California Air Resources Board (CARB) adopted the Advanced Clean Trucks (ACT) rule, which requires the sale of zero-emission or near zero-emission heavy duty trucks starting with the manufacturer-designated model year 2024. Sales requirements are defined separately for three vehicle groups: Class 2b-3 trucks and vans, Class 4-8 rigid trucks, and Class 7-8 tractor trucks. The regulation is structured as a credit and deficit accounting system. In 2023, the EPA granted the state the waiver it needs to enact the ACT rule. The enacted rule requires truck makers to sell an increasing percentage of electric models annually through 2035. Forty percent of big rigs, half of all cargo and travel vans and 75 percent of box truck and dump truck sales need to be zero emissions by 2035.

CARB Mobile-Source Regulation

The State of California is responsible for controlling emissions from the operation of motor vehicles in the State. Rather than mandating the use of specific technology or the reliance on a specific fuel, the CARB motor vehicle standards specify the allowable grams of pollution per mile driven. In other words, the regulations focus on the reductions needed rather than on the way they are achieved. Towards this end, the CARB has adopted regulations which require auto manufacturers to phase in less polluting vehicles.

California Clean Air Act

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. The CARB is the agency responsible for administering the CCAA. The CARB established ambient air quality standards pursuant to the California Health and Safety Code (CH&SC) [§39606(b)], which are like the federal standards.

California Air Quality Standards

Although NAAQS are determined by the U.S. EPA, states can set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards. Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates, and lead. In addition, California has created standards for pollutants that are not covered by federal standards. Although there is some variability among the health effects of the CAAQS pollutants, each has been linked to multiple adverse health effects including, among others, premature death, hospitalizations, and emergency department visits for exacerbated chronic disease, and increased symptoms such as coughing and wheezing. The existing state and federal primary standards for major pollutants are shown in Table 3.3-1.

Air quality standard setting in California commences with a critical review of all relevant peer reviewed scientific literature. The Office of Environmental Health Hazard Assessment (OEHHA) uses the review of health literature to develop a recommendation for the standard. The recommendation can be for no change, or can recommend a new standard. The review, including the OEHHA recommendation, is summarized in a document called the draft Initial Statement of Reasons (ISOR), which is released for comment by the public, and for public peer review by the Air Quality Advisory Committee (AQAC). AQAC members are appointed by the President of the University of California for their expertise in the range of subjects covered in the ISOR, including health, exposure, air quality monitoring, atmospheric chemistry and physics, and effects on plants, trees, materials, and ecosystems. The Committee provides written comments on the draft ISOR. The ARB staff next revises the ISOR based on comments from AQAC and the public. The revised ISOR is then released for a 45-day public comment period prior to consideration by the Board at a regularly scheduled Board hearing.

In June of 2002, the CARB adopted revisions to the PM_{10} standard and established a new $PM_{2.5}$ annual standard. The new standards became effective in June 2003. Subsequently, staff reviewed the published scientific literature on ground-level ozone and nitrogen dioxide and the CARB adopted revisions to the standards for these two pollutants. Revised standards for ozone and nitrogen dioxide went into effect on May 17, 2006 and March 20, 2008, respectively. These revisions reflect the most recent changes to the CAAQS.

Tanner Air Toxics Act (TACs)

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and has adopted U.S. EPA's list of HAPs as TACs. Most recently, diesel PM was added to the CARB list of TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technologies (BACT) to minimize emissions.

AB 2588 requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, CARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses. These rules and standards provide for (1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus fleet rule.

Omnibus Low-NOx Rule

The CARB approved the Omnibus Low-NOx Rule on August 28, 2020, which will require engine NOx emissions to be cut to approximately 75% below current standards beginning in 2024, and 90%

below current standards in 2027. The rule also places nine additional regulatory requirements on new heavy-duty truck and engines. Those additional requirements include a 50% reduction in particulate matter emissions, stringent new low-load and idle standards, a new in-use testing protocol, extended deterioration requirements, a new California-only credit program, and extended mandatory warranty requirements. The regulatory requirements in the Omnibus Low-NOX Rule will first become effective in 2024, at the same time as the Advanced Clean Trucks regulations that CARB approved that mandates manufacturers convert increasing percentages of their heavy-duty trucks sold in California to zero-emission vehicles.

Assembly Bill 170

Assembly Bill 170, Reyes (AB 170), was adopted by state lawmakers in 2003, creating Government Code Section 65302.1, which requires cities and counties in the San Joaquin Valley to amend their general plans to include data and analysis, comprehensive goals, policies, and feasible implementation strategies designed to improve air quality. The elements to be amended include, but are not limited to, those elements dealing with land use, circulation, housing, conservation, and open space. Section 65302.1.c identifies four areas of air quality discussion required in these amendments:

- A report describing local air quality conditions, attainment status, and state and federal air quality and transportation plans;
- A summary of local, district, state, and federal policies, programs, and regulations to improve air quality;
- A comprehensive set of goals, policies, and objectives to improve air quality; and
- Feasible implementation measures designed to achieve these goals.

LOCAL

City of Lathrop General Plan

The City of Lathrop General Plan includes several policies and actions that are relevant to air quality. General Plan policies and actions applicable to the Project are identified below:

POLICIES: LAND USE ELEMENT

Policy LU-3.1 Support regional efforts that promote higher densities and intensities near major transit and travel facilities, and reduce regional vehicle miles traveled by supporting active modes of transportation including walking, biking, and public transit.

Policy LU-3.2 Utilize planning tools and objectives that promote transit-oriented and mixed-use development objectives near future ACE and Valley Link Transit Facilities. Land use plans for these areas should complement transit facilities to accommodate transit oriented development (TOD) developments and/or park-and-ride facilities near ACE stations and future Valley Link station.

Policy LU-3.3 Integrate climate change and adaptation planning principles into future updates of the Zoning Code, and other related long-range utilities and facilities planning documents.

(See the Safety Element for additional policies related to climate change and resiliency planning).

Policy LU-3.4 Promote logical City boundaries and work with surrounding jurisdictions to encourage complementary uses. Specifically, work with the City of Manteca and San Joaquin County to ensure development of complementary and compatible uses adjacent to Lathrop.

Policy LU-4.2 Emphasize efforts to reduce regional vehicle miles traveled (VMT) by supporting land use patterns and site designs that promote active modes of transportation, and public transit.

Policy LU-4.4 As the city grows, encourage and support the development of a transit system with regular service connecting destinations within the city, to ACE and Valley Link stations, and to adjacent jurisdictions.

Policy LU-5.1 Require new development to be compatible and complementary to existing development. Where appropriate and feasible, promote connections between neighborhoods and services and facilities.

ACTIONS: LAND USE ELEMENT

Action LU-3.b Work with adjacent jurisdictions to facilitate increased compatibility and access across barriers to travel such as discontinuous streets, bike lanes, sidewalks, and paths.

Action LU-3.c Work with developers, reclamation districts and utility providers to create or expand linear parks, trails, and publicly-accessible greenways along levees, drainage and utility rights-of-way that provide opportunities for greenway connections and passive recreational opportunities.

Action LU-5b Through the development review process, analyze land use compatibility and require adequate buffers and/or architectural enhancements to protect sensitive receptors from intrusion of development activities that may cause unwanted nuisances and health risks.

POLICIES: CIRCULATION ELEMENT

Policy CIR-1.2 Complete Streets. Consider all modes of travel in planning, design, and construction of all transportation projects to create safer, more livable, and more inviting environments for pedestrians, bicyclists, motorists and public transit users of all ages and capabilities.

Policy CIR-2.1 Bicycle and Pedestrian Networks. Establish a network of identified bicycle and pedestrian routes connecting residential areas with schools, recreation, shopping, and employment areas within the City.

Policy CIR-2.3 Safe Routes to School. Consider walking and bicycling school access as a priority over vehicular movements when any such conflicts occur.

Policy CIR-2.4 Transit Access. Provide safer, more convenient access to transit service including rail, bus, and paratransit.

Policy CIR-2.5 Amenities. To support bicycle, pedestrian, and transit usage, provide amenities including pedestrian-scale lighting, bicycle parking, shade trees and landscaping, and bus shelters and benches.

Policy CIR-4.1 Land Use Supporting Reduced VMT. Support land use with increased land use densities and mixed uses, consistent with the Land Use Element, to reduce vehicle miles traveled and promote the use of walking, biking, and transit.

Policy CIR-4.2 Demand Management. Encourage employers to provide programs for carpooling/transit/biking/walking, transit ridership subsidies, bicycle facilities, alternative work schedules, ridesharing, telecommuting, working at home, employee education, and preferential parking for carpools/vanpools.

Policy CIR-4.3 New Technologies. Monitor deployment of new transportation technologies and services and develop policies that implement best practices to ensure these technologies and services benefit the public and the multimodal transportation system.

Policy CIR-4.4 Electric Vehicle Charging. Support the creation of electric vehicle charging stations at multifamily residential, commercial, government, and other employment and community destinations.

ACTIONS: CIRCULATION ELEMENT

Action CIR-1b Require development projects to arrange streets in an interconnected pattern, so that pedestrians, bicyclists, and drivers are not forced onto arterial streets for inter- or intra-neighborhood travel. This approach will also increase the safety and efficiency of movement of emergency responders and reduce vehicle miles traveled within the community.

Action CIR-1c Apply signals, roundabouts, traffic circles and other traffic management techniques appropriately at residential and collector street intersections with collector and arterial streets in order to allow bicyclists and pedestrians to travel more conveniently and more safely from one neighborhood to another.

Action CIR-1d Use traffic calming tools to assist in implementing complete street principles; possible tools include roundabouts, raised intersections, curb extensions, reduced roadway width, and high visibility crosswalks.

Action CIR-2a Create an active transportation plan supporting the development of bicycle and pedestrian networks across the City and funding applications for bicycle and pedestrian improvements.

Action CIR-2b Add planned bicycle and pedestrian facilities in conjunction with road rehabilitation, reconstruction, or re-striping projects whenever feasible.

Action CIR-2c Enhance sidewalks to create a high-quality pedestrian environment, including wider sidewalks and improved pedestrian crossings, landscaping, buffers between sidewalks and vehicle travel lanes, enhanced pedestrian lighting, wayfinding signage, shade trees, and canopies, increased availability of benches, and other features.

Action CIR-2d Improve bicycle facilities to include attractive and secure bicycle parking, bicycle lanes, bike paths, and wayfinding signage along appropriate roadways.

Action CIR-2e Encourage and support the enhancement of transit stops with high quality, well-maintained shelters, and provision of wayfinding signage and transit timetables.

Action CIR-2f Provide access for bicycles and pedestrians at the ends of cul-de-sacs and through walls and berms, where right-of-way is available, to provide convenient access within and between neighborhoods and to encourage walking and bicycling to neighborhood destinations.

Action CIR-2g Ensure that development and infrastructure projects are designed to provide pedestrian and bicycle access and leave no gaps in the bicycle and pedestrian networks.

Action CIR-2h Require new development to provide bicycle parking and shower and locker facilities at commercial, business/professional and light industrial uses in accordance with the California Green Building Standards Code. Encourage existing uses to provide such facilities.

Action CIR-2j Create an off-street shared-use path system for use by pedestrians and bicyclists for transportation and recreation.

Action CIR-2k Create bicycle and pedestrian connections to adjacent jurisdictions via shared use paths, bikeways, and sidewalks.

Action CIR-2l Create bicycle and pedestrian connections to the ACE station, planned Valley Link stations, and other transit stops.

Action CIR-2m Encourage transit providers to improve passenger pick-up and drop-off areas at the ACE and planned Valley Link stations to provide more convenient access.

Action CIR-2n Partner with neighboring jurisdictions and regional transit providers (including San Joaquin Regional Transit District, Manteca Transit, and Tracy TRACER Bus Services) to expand transit service between Lathrop and destinations in other jurisdictions.

Action CIR-2o Coordinate with transit providers and encourage them to enhance transit amenities for safe and comfortable access to transit including waiting areas, seating, landscaping, lighting, shade and rain cover, trash receptacles, and passenger loading zones.

Action CIR-4a Refine and update the City of Lathrop interim VMT thresholds and screening criteria to reflect the updated VMT analysis completed for the General Plan update if such updates are deemed necessary or warranted.

Action CIR-4b Evaluate the feasibility of a local or regional VMT impact fee program, bank, or exchange. Such an offset program, if determined feasible, would be administered by the City or a City-approved agency, and would offer demonstrated VMT reduction strategies through transportation demand management programs, impact fee programs, mitigation banks or exchange programs, in-lieu fee programs, or other land use project conditions that reduce VMT in a manner consistent with state guidance on VMT reduction. If, through on-site changes, a subject project cannot eliminate VMT impacts, the project could contribute on a pro-rata basis to a local or regional VMT reduction bank or exchange, as necessary, to reduce net VMT impacts.

Action CIR-4c Require proposed development projects that could have a potentially significant VMT impact to consider reasonable and feasible project modifications and other measures during the project design and environmental review stage of project development that would reduce VMT effects in a manner consistent with state guidance on VMT reduction.

Action CIR-4e Partner with SJCOG on the Dibs program, which is the regional smart travel program, including rideshare, transit, walking, and biking.

Action CIR-4f As new transportation technologies and mobility services, including autonomous vehicles, electric vehicles, electric bicycles and scooters, and transportation network companies (e.g., Uber and Lyft) are implemented and used by the public, review and update City policies and plans to maximize the benefit to the public of such technologies and services without adversely affecting the City's transportation network. Updates to the City's policies and plans may cover topics such as electric vehicle charging stations, curb space management, changes in parking supply requirements, policies regarding electric scooter use, etc.

Action CIR-4i As part of the development of or participation in any ridesharing program, including for shared automated vehicle fleets, ensure that the program considers the safety needs of vulnerable populations and loading needs of seniors, families with children, and individuals with mobility impairments.

Action CIR-4j As need for transit grows, review and consider alternatives to conventional bus systems, such as smaller shuttle buses (micro-transit), on-demand transit services, or transportation networking company services that connect neighborhood centers to local activity centers with greater cost efficiency.

Action CIR-4k Require new development to incorporate electric vehicle charging in accordance with the California Green Building Standards Code. Encourage installation of electric vehicle charging stations at existing development.

POLICIES: RECREATION AND RESOURCES ELEMENT

Policy RR-6.1 Regional Standards. Coordinate planning efforts with the San Joaquin Valley Air Pollution Control District (SJVAPCD), San Joaquin Council of Governments, and the California Air Resource Board to meet local and regional air quality standards and ensure attainment of established goals.

Policy RR-6.2 Sensitive Receptors. Minimize the community's exposure to toxic and harmful air emissions and odors by requiring an adequate buffer or distance between residential and other sensitive receptors and industrial-type uses that typically generate air pollutants, toxic air contaminants, and/or obnoxious fumes or odors.

Policy RR-6.3 Construction Activities. Require new construction to minimize fugitive dust and construction vehicle emissions.

Policy RR-6.4 Development. Encourage the development of mixed-use residential opportunities and live-work environments within the City to lessen the impacts of traffic congestion on local air quality.

Policy RR-6.5 Appliances and Equipment. Require appliances and equipment, including wood-burning devices, in development projects to meet current standards for controlling air pollution, including particulate matter and toxic air contaminants.

Policy RR-6.6 Combustible Materials. Cooperate with the Air District to ensure that burning of any combustible material within the City is consistent with Air District regulations to minimize particulate air pollution.

Policy RR-6.7 Mitigation. Require the implementation of relevant mitigation measures for all future development upon identification of potential air quality impacts.

Policy RR-6.8 Local Reduction Targets. The City of Lathrop establishes the following per capita GHG reduction targets, in order to meet the requirements established by the state under AB 32 and SB 32, consistent with the CARB's 2017 Scoping Plan:

A. 3.99 MT CO2e per capita by 2030

B. 2.66 MT CO2e per capita by 2040; and

C. 1.33 MT CO2e per capita by 2050.

Policy RR-6.9 GHG Reduction. Consider, and implement as feasible, new policies and programs that will help to provide energy efficient alternatives to fossil fuel use and reduce consumption in order to reduce greenhouse gas emissions.

Policy RR-6.10 Public Engagement. Promote regional air quality programs to inform the public on regional air quality concerns and encourage the engagement of all Lathrop residents in future planning decisions related to air quality.

ACTIONS: RECREATION AND RESOURCES ELEMENT

Action RR-6a Review development, infrastructure, and planning projects for consistency with SJVAPCD requirements during the CEQA review process. Require project applicants to prepare air quality analyses to address SJVAPCD and General Plan requirements, which include analysis and identification of:

A. Air pollutant emissions associated with the project during construction, project operation, and cumulative conditions.

B. Potential exposure of sensitive receptors to toxic air contaminants.

C. Significant air quality impacts associated with the project for construction, project operation, and cumulative conditions.

D. Mitigation measures to reduce significant impacts to less than significant or the maximum extent feasible where impacts cannot be mitigated to less than significant.

Action RR-6b Review all new industrial and commercial development projects for potential air quality impacts to residences and other sensitive receptors. Ensure that mitigation measures and best management practices are implemented to reduce significant emissions of criteria pollutants.

Action RR-6c Work with SJCOG and the SJVAPCD to implement plans and programs aimed at improving regional air quality.

Action RR-6d Continue to review development projects to ensure that all new public and private development complies with the California Code of Regulations (CCR), Title 24 standards as well as the energy efficiency standards established by the Lathrop Municipal Code.

Action RR-6e Monitor GHG emissions generated by the community over time for consistency with the established GHG reduction targets, and update the City's community GHG Inventory every five years. In the event that the City determines that ongoing efforts to reduce GHG emissions are not on track to meet the City's adopted GHG reduction targets, the City shall establish and adopt new and/or revised GHG reductions measures that will effectively meet the established GHG reduction targets.

Action RR-6f Continue the expansion of infrastructure to facilitate the use of City-owned low or zero emission vehicles such as electric vehicle charging facilities and conveniently located alternative fueling stations at key City facilities as operations necessitate and/or as funding becomes available.

Action RR-6g Evaluate and consider multi-modal transportation benefits to all City employees, such as free or low-cost monthly transit passes. Encourage employer participation in similar programs. Encourage new transit/shuttle services and use.

Action RR-6h Encourage community car-sharing and carpooling.

Action RR-6i Support the establishment and expansion of a regional network of electric vehicle charging stations and encourage the expanded use of electric vehicles.

Action RR-6j Establish and adopt standards and requirements for electric vehicle parking, including minimum requirements for the installation of electric vehicle charging stations in new multi-family residential and commercial, office, and light industrial development.

Action RR-6k Consider instituting a Green Building Program to reflect best practices, such as encouraging the use of cement substitutes and recycled building materials for new construction.

Action RR-6l Continue cooperating with the SJVAPCD by requiring a dust management plan to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard prior to construction and grading.

San Joaquin Valley Air Pollution Control District

The primary role of SJVAPCD is to develop plans and implement control measures in the SJVAB to control air pollution. These controls primarily affect stationary sources such as industry and power plants. Rules and regulations have been developed by SJVAPCD to control air pollution from a wide range of air pollution sources. SJVAPCD also provides uniform procedures for assessing potential air quality impacts of proposed projects and for preparing the air quality section of environmental documents.

AIR QUALITY PLANNING

The U.S. EPA requires states that have areas that do not meet the National AAQS to prepare and submit air quality plans showing how the National AAQS will be met. If the states cannot show how the National AAQS will be met, then the states must show progress toward meeting the National AAQS. These plans are referred to as the State Implementation Plans (SIP). California's adopted 2007 State Strategy was submitted to the U.S. EPA as a revision to its SIP in November 2007.[5] More recently, in October 2018, the CARB adopted the 2018 Updates to the California State Implementation Plan.

In addition, the CARB requires regions that do not meet California AAQS for ozone to submit clean air plans (CAPs) that describe measures to attain the standard or show progress toward attainment. To ensure federal CAA compliance, SJVAPCD is currently developing plans for meeting new National AAQS for ozone and $PM_{2.5}$ and the California AAQS for PM_{10} in the SJVAB (for California CAA compliance).[6] The following describes the air plans prepared by the SJVAPCD, which are incorporated by reference per CEQA Guidelines Section 15150.

1-HOUR OZONE PLAN

Although U.S. EPA revoked its 1979 1-hour ozone standard in June 2005, many planning requirements remain in place, and SJVAPCD must still attain this standard before it can rescind CAA Section 185 fees. The SJVAPCD's most recent 1-hour ozone plan, the 2013 Plan for the Revoked 1-hour Ozone Standard, demonstrated attainment of the 1-hour ozone standard by 2017. However, on July 18, 2016, the U.S. EPA published in the Federal Register a final action determining that SJVAB has attained the 1-hour ozone NAAQS based on the 2012 to 2014 three-year period allowing nonattainment penalties to be lifted under federal Clean Air Act section 179b (SJVAPCD, 2015).

8-HOUR OZONE PLAN

The SJVAPCD's Governing Board adopted the 2007 Ozone Plan on April 30, 2007. This far-reaching plan, with innovative measures and a "dual path" strategy, assures expeditious attainment of the federal 8-hour ozone standard as set by U.S. EPA in 1997. The plan projects that the valley will achieve the 8-hour ozone standard for all areas of the SJVAB no later than 2023. The CARB approved

[5] Note that the plan was adopted by CARB on September 27, 2007; California Air Resources Board. 2007. California Air Resources Board's Proposed State Strategy for California's 2007 State Implementation Plan.
[6] SJVAPCD, 2012. 2012 $PM_{2.5}$ Plan.

the plan on June 14, 2007. The U.S. EPA approved the 2007 Ozone Plan effective April 30, 2012. SJVAPCD adopted the 2016 Ozone Plan to address the federal 2008 8-hour ozone standard, which must be attained by end of 2031.[7,8]

PM_{10} PLAN

Based on PM_{10} measurements from 2003 to 2006, the U.S. EPA found that the SJVAB has reached federal PM_{10} standards. On September 21, 2007, the SJVAPCD's Governing Board adopted the 2007 PM_{10} Maintenance Plan and Request for Redesignation. This plan demonstrates that the valley will continue to meet the PM_{10} standard. U.S. EPA approved the document and on September 25, 2008, the SJVAB was redesignated to attainment/maintenance (SJVAPCD, 2015).

PM2.5 PLAN

The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards on November 15, 2018.[9] This plan addresses the U.S. EPA federal 1997 annual $PM_{2.5}$ standard of 15 µg/m³ and 24-hour $PM_{2.5}$ standard of 65 µg/m³; the 2006 24-hour $PM_{2.5}$ standard of 35 µg/m³; and the 2012 annual $PM_{2.5}$ standard of 12 µg/m³. This plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable (SJVAPCD, 2020).

All the above-referenced plans include measures (i.e., federal, state, and local) that would be implemented through rule making or program funding to reduce air pollutant emissions in the SJVAB. Transportation control measures are part of these plans.

SJVAPCD RULES AND REGULATIONS

SJVAPCD Indirect Source Review

On December 15, 2005, SJVAPCD adopted the Indirect Source Review Rule (ISR or Rule 9510) to reduce ozone precursors (i.e., ROG and NOx) and PM_{10} emissions from new land use development projects. Specifically, Rule 9510 targets the indirect emissions from vehicles and construction equipment associated with these projects and applies to both construction and operational-related impacts. The rule applies to any applicant that seeks to gain a final discretionary approval for a development project, or any portion thereof, which upon full buildout would include any one of the following:

- 50 residential units.
- 2,000 square feet of commercial space.
- 25,000 square feet of light industrial space.

---

[7] SJVAPCD. Ozone Plans. http://www.valleyair.org/ Air_Quality_Plans/Ozone_Plans.htm, accessed August 15, 2024.

[8] SJVAPCD. 2016 Plan for the 2008 8-Hour Ozone Standard, http://www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm, accessed April 23, 2024.

[9] SJVAPCD. Particulate Matter Plans. http://valleyair.org/Air_Quality_Plans/PM_Plans.htm, accessed August 15, 2024.

- 100,000 square feet of heavy industrial space.
- 20,000 square feet of medical office space.
- 39,000 square feet of general office space.
- 9,000 square feet of educational space.
- 10,000 square feet of government space.
- 20,000 square feet of recreational space.
- 9,000 square feet of space not identified above.
- Transportation/transit projects with construction exhaust emissions of two or more tons of NOx or two or more tons of PM_{10}.
- Residential projects on contiguous or adjacent property under common ownership of a single entity in whole or in part, that is designated and zoned for the same development density and land use, regardless of the number of tract maps, and has the capability of accommodating more than 50 residential units.
- Nonresidential projects on contiguous or adjacent property under common ownership of a single entity in whole or in part, that is designated and zoned for the same development density and land use, and has the capability of accommodating development projects that emit two or more tons per year of NOx or PM_{10} during project operations.

The rule requires all subject, nonexempt projects to mitigate both construction and operational period emissions by (1) applying feasible SJVAPCD-approved mitigation measures, or (2) paying any applicable fees to support programs that reduce emissions. Off-site emissions reduction fees (off-site fee) are required for projects that do not achieve the required emissions reductions through on-site emission reduction measures. Phased projects can defer payment of fees in accordance with an Off-site Emissions Reduction Fee Deferral Schedule (FDS) approved by the SJVAPCD.

To determine how an individual project would satisfy Rule 9510, each project would submit an air quality impact assessment (AIA) to the SJVAPCD as early as possible, but no later than prior to the project's final discretionary approval, to identify the project's baseline unmitigated emissions inventory for indirect sources: on-site exhaust emissions from construction activities and operational activities from mobile and area sources of emissions (excludes fugitive dust and permitted sources). Rule 9510 requires the following reductions, which are levels that the SJVAPCD has identified as necessary, based on their air quality management plans, to reach attainment for ozone and particulate matter:

Construction Equipment Emissions

The exhaust emissions for construction equipment greater than 50 horsepower (hp) used or associated with the development project shall be reduced by the following amounts from the statewide average as estimated by CARB:

- 20 percent of the total NOx emissions
- 45 percent of the total PM_{10} exhaust emissions

Mitigation measures may include those that reduce construction emissions on-site by using less polluting construction equipment, which can be achieved by utilizing add-on controls, cleaner fuels, or newer, lower emitting equipment.

Operational Emissions

- NOx Emissions. Applicants shall reduce 33.3 percent of the project's operational baseline NOx emissions over a period of 10 years as quantified in the approved AIA.
- PM_{10} Emissions. Applicants shall reduce of 50 percent of the project's operational baseline PM_{10} emissions over a period of 10 years as quantified in the approved AIA.

These requirements listed above can be met through any combination of on-site emission reduction measures. If a project cannot achieve the above standards through imposition of mitigation measures, then the project would be required to pay the applicable off-site fees. These fees are used to fund various incentive programs that cover the purchase of new equipment, engine retrofit, and education and outreach.

Fugitive PM_{10} Prohibitions

SJVAPCD controls fugitive PM_{10} through Regulation VIII, Fugitive PM_{10} Prohibitions. The purpose of this regulation is to reduce ambient concentrations of PM_{10} and $PM_{2.5}$ by requiring actions to prevent, reduce, or mitigate anthropogenic (human caused) fugitive dust emissions.

- Regulation VIII, Rule 8021 applies to any construction, demolition, excavation, extraction, and other earthmoving activities, including, but not limited to, land clearing, grubbing, scraping, travel on-site, and travel on access roads to and from the site.
- Regulation VIII, Rule 8031 applies to the outdoor handling, storage, and transport of any bulk material.
- Regulation VIII, Rule 8041 applies to sites where carryout or trackout has occurred or may occur on paved roads or the paved shoulders of public roads.
- Regulation VIII, Rule 8051 applies to any open area having 0.5 acre or more within urban areas or 3.0 acres or more within rural areas, and contains at least 1,000 square feet of disturbed surface area.
- Regulation VIII, Rule 8061 applies to any new or existing public or private paved or unpaved road, road construction project, or road modification project.
- Regulation VIII, Rule 8071 applies to any unpaved vehicle/equipment traffic area.
- Regulation VIII, Rule 8081 applies to off-field agricultural sources.

Sources regulated are required to provide Dust Control Plans that meet the regulation requirements. Under Rule 8021, a Dust Control Plan is required for any residential project that will include 10 or more acres of disturbed surface area, a nonresidential project with 5 or more acres of disturbed surface area, or a project that relocates 2,500 cubic yards per day of bulk materials for at least three days. The Dust Control Plan is required to be submitted to SJVAPCD prior to the start of any construction activity. The Dust Control Plan must also describe fugitive dust control measure to be implemented before, during, and after any dust-generating activity. For sites smaller than those listed above, the project is still required to notify SJVAPCD a minimum of 48 hours prior to commencing earthmoving activities.

National Emission Standards for Hazardous Air Pollutants

Rule 4002 applies in the event an existing building will be renovated, partially demolished, or removed (National Emission Standards for Hazardous Air Pollutants); this rule applies to all sources of Hazardous Air Pollutants.

Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations

If asphalt paving will be used, then paving operations of the proposed Project will be subject to Rule 4641. This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations.

Nuisance Odors

SJVAPCD controls nuisance odors through implementation of Rule 4102, Nuisance. Pursuant to this rule, "a person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property."

Employer Based Trip Reduction Program

SJVAPCD has implemented Rule 9410, Employer Based Trip Reduction. The purpose of this rule is to reduce VMT from private vehicles used by employees to commute to and from their worksites to reduce emissions of NOx, ROG, and particulate matter (PM_{10} and $PM_{2.5}$). The rule applies to employers with at least 100 employees. Employers are required to implement an Employer Trip Reduction Implementation Plan (ETRIP) for each worksite with 100 or more eligible employees to meet applicable targets specified in the rule. Employers are required to facilitate the participation of the development of ETRIPs by providing information to its employees explaining the requirements and applicability of this rule. Employers are required to prepare and submit an ETRIP for each worksite to the District. The ETRIP must be updated annually. Under this rule, employers shall collect information on the modes of transportation used for each eligible employee's commutes both to and from work for every day of the commute verification period, as defined in using either the mandatory commute verification method or a representative survey method. Annual reporting includes the results of the commute verification for the previous calendar year along with the measures implemented as outlined in the ETRIP and, if necessary, any updates to the ETRIP.

3.3.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed Project will have a significant impact on the environment associated with air quality if it will:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; and/or

- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

APPROACH TO ANALYSIS

While the final determination of whether a project is significant is within the purview of the Lead Agency pursuant to Section 15064(b) of the CEQA Guidelines, the SJVAPCD recommends that its quantitative air pollution thresholds be used to determine the significance of project emissions. If the Lead Agency finds that the project would exceed these air pollution thresholds, the project should be considered to have significant air quality impacts. The applicable SJVAPCD thresholds and methodologies are contained under each impact statement below, as the City, in its discretion, has determined to utilize these thresholds and methodologies, which are based on scientific and factual data.

This analysis was performed consistent with the guidance and methodologies provided by the SJVAPCD's GAMAQI.[10] Based on the SJVAPCD New Source Review (NSR) offset requirements for stationary sources, the SJVAPCD has established thresholds of significance for criteria pollutant emissions, shown in Table 3.3-6. These thresholds apply to the project because these air pollutants would be generated during project construction and operation and constitute criteria pollutants or precursor emissions for criteria pollutants, which are regulated by the federal and State Clean Air Acts.

TABLE 3.3-6: SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT SIGNIFICANCE THRESHOLDS

POLLUTANT	*CONSTRUCTION THRESHOLDS (TPY)*	*OPERATIONAL THRESHOLDS (TPY)*
ROG	10	10
NOx	10	10
CO	100	100
SOx	27	27
PM_{10}	15	15
$PM_{2.5}$	15	15

SOURCES: SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT (SJVAPCD). 2015. GUIDANCE FOR ASSESSING AND MITIGATING AIR QUALITY IMPACT. WEBSITE: HTTPS://WWW.VALLEYAIR.ORG/TRANSPORTATION/CEQA%20RULES/GAMAQI%20JAN%202002%20REV.PDF ACCESSED AUGUST 13, 2024.

CRITERIA POLLUTANT EMISSIONS MODELING

California Emission Estimator Model (CalEEMod)™ (v.2022.1), developed for the California Air Pollution Officers Association (CAPCOA) in collaboration with California air districts, was used to estimate emissions for the proposed Project. Project construction was assumed to be completed in 2026. However, the exact timing of Project construction would depend on market conditions. The

[10] San Joaquin Valley Air Pollution Control District (SJVAPCD). 2015. Guidance for Assessing and Mitigating Air Quality Impact. Website: https://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI%20Jan%202002%20Rev.pdf Accessed August 13, 2024.

modeled construction schedule is conservative, in that it assumes buildout of the Project at the earliest plausible date; this represents a conservative approach to modeling, since the emissions efficiency of on- and off-road construction vehicles would increase over time.

The land use assumptions for the modeling are consistent with the land uses as decribed in Chapter 2.0: Project Description of this Draft EIR (chosen on a best fit basis, given the available land uses within the CalEEMod model):

- Single Family Housing: 912 Dwelling Units (146.7 acres);
- City Park: 16.5 acres

The construction phase details are provided in Table 3.3-7, below. The construction schedule was adjusted based on Project size and type. Project operation was assumed to occur by 2026.

TABLE 3.3-7: ANTICIPATED CONSTRUCTION SCHEDULE

CALEEMOD PHASE	*CALEEMOD PHASE START DATE*	*CALEEMOD PHASE END DATE*
Site Preparation	5/1/2025	7/24/2025
Grading	7/25/2025	10/2/2025
Building Construction	10/3/2025	12/31/2026
Paving	10/3/2025	1/31/2026
Architectural Coatings	10/3/2025	12/31/2026

SOURCE: CALEEMOD (V.2022.1)

IMPACTS AND MITIGATION MEASURES

Impact 3.3-1: Project operation would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment, or conflict or obstruct implementation of the District's air quality plan. (Less than Significant)

The SJVAPCD is tasked with implementing programs and regulations required by the Federal Clean Air Act and the California Clean Air Act. In that capacity, the SJVAPCD has prepared plans to attain Federal and State ambient air quality standards. To achieve attainment with the standards, the SJVAPCD has established thresholds of significance for criteria pollutant emissions in their *SJVAPCD Guidance for Assessing and Mitigating Air Quality Impacts* (2015). Projects with emissions below the thresholds of significance for criteria pollutants would be determined to "Not conflict or obstruct implementation of the District's air quality plan."

The proposed Project would be both a direct and indirect source of air pollution. Direct sources of pollution include area, energy, and water and waste sources, due to development of the on-site buildings and associated infrastructure. Indirect sources of pollution would be due to the generation of trips of from vehicles traveling to and from the Project site.

CalEEMod^{TM} (v.2022.1) was used to model operational emissions of the proposed Project. Table 3.3-8 shows proposed Project unmitigated emissions as provided by CalEEMod. The SJVAPCD provides a list of applicable air quality emissions thresholds.

TABLE 3.3-8: OPERATIONAL PROJECT GENERATED EMISSIONS (TONS PER YEAR) - UNMITIGATED

POLLUTANT	CO	NOx	ROG	SOx	PM_{10}	$PM_{2.5}$
THRESHOLD	100	10	10	27	15	15
EMISSIONS						
MOBILE	32.4	3.52	3.42	0.1	11.4	2.95
AREA	4.68	0.04	4.43	<0.1	<0.1	<0.1
ENERGY	0.52	1.22	0.07	<0.1	0.1	0.1
TOTAL EMISSIONS	**37.6**	**4.79**	**7.93**	**0.11**	**11.5**	**3.05**
EXCEEDS THRESHOLD?	**N**	**N**	**N**	**N**	**N**	**N**

SOURCES: CALEEMOD (V.2022.1)

The SJVAPCD has established their thresholds of significance by which the Project emissions are compared against to determine the level of significance. The SJVAPCD has established operations related emissions thresholds of significance as follows: 100 tons per year of carbon monoxide (CO), 10 tons per year of oxides of nitrogen (NO_x), 10 tons per year of reactive organic gases (ROG), 27 tons per year of sulfur oxides (SO_x), 15 tons per year particulate matter of 10 microns or less in size (PM_{10}), and 15 tons per year particulate matter of 2.5 microns or less in size ($PM_{2.5}$). If the proposed Project's emissions will exceed the SJVAPCD's threshold of significance for operational-generated emissions, the proposed Project will have a significant impact on air quality and all feasible mitigation are required to be implemented to reduce emissions to the extent feasible. As shown in Table 3.3-8 above, the unmitigated operational emissions would not exceed the SJVACPD operational thresholds of significance for any of the criteria air pollutants.

The Project's operational CO, NOx, and PM_{10} emissions are primarily from the Project's mobile vehicle emissions. However, most ROG emissions, and a substantial source of CO emissions, are from area sources, which include off-gassing from architectural coatings, off-gassing from consumer products, and the usage of landscape equipment. Therefore, this impact would be considered ***less than significant***.

REGULATORY COMPLIANCE

In accordance with SJVAPCD Rule 9510, an Air Impact Assessment (AIA) is required to be prepared based on the applicability and exemption criteria of Rule 9510.[11] The rule includes general mitigation requirements for construction and/or operational emissions. Per the general mitigation requirements of Rule 9510, the Project is required to reduce the project's operational baseline NOx emissions by 33.3% over a period of ten years as quantified in the approved AIA. The project is also required to pay any off-site fees in full by the invoice due date or prior to generating the emissions associated with the Project or any phase thereof, whichever occurs first.

Separately, the Project would comply with SJVAPCD Rule 4101, which prohibits emissions of visible air contaminants to the atmosphere and applies to any source operation that emits or may emit air

[11] Available at: https://www.valleyair.org/rules/currntrules/r9510-a.pdf. Accessed: August 2024.

contaminants. Furthermore, the project would comply with SJVAPCD Rule 4601, which limits requires the Project to abide by more stringent VOC emissions requirements. Emissions of volatile organic compounds from architectural coatings by specifying storage, clean up and labeling requirements.

Implementation of these and other SJVAPCD rules and regulations would further reduce Project emissions below the levels identified in Table 3.3-8.

PROJECT EFFECTS ON PUBLIC HEALTH

Criteria pollutants generated by the Project are associated with some form of health risk (e.g., asthma). Criteria pollutants can be classified as either regional or localized pollutants. Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. Ozone is considered a regional criteria pollutant, whereas CO, NO_2, SO_2, and lead (Pb) are localized pollutants. PM can be both a local and a regional pollutant, depending on its composition. The SJVAPCD establishes thresholds at levels that allow the SJVAPCD to come into compliance with the CAAQS and NAAQS. The CAAQS and NAAQS are set at levels protective of human health, and emissions below the SJVAPCD thresholds are deemed to not have a significant impact on human health.

Ozone

O_3 is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC) (also known as ROG) and oxides of nitrogen (NO_x) in the presence of sunlight. The reactivity of O_3 causes health problems because it damages lung tissue, reduces lung function, and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to O_3 for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms including chest pain, coughing, sneezing and pulmonary congestion.

Studies show associations between short-term ozone exposure and non-accidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths (U.S. EPA 2019a). The concentration of ozone at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrement in forced airway volume in the most responsive individual. Although the results vary, evidence suggest that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion (U.S. EPA 2019b).

Health incidence rates and other health data are typically collected by the government as well as the World Health Organization. The Environmental Benefits Mapping and Analysis Program (BenMAP), developed by the U.S. EPA, is a powerful and flexible tool that helps users estimate human health effects and economic benefits resulted from changes in air quality. BenMAP outputs include PM- and ozone-related health endpoints such as premature mortality, hospital admissions, and emergency room visits. BenMAP calculates background health incidence rates based on the available health statistics and population data, with preference given to individual-level data counts (e.g., mortality counts or hospital and emergency department discharges) at the County-level. For California counties, data were available at the individual-level. The background health incidence data are also based on different years depending on data availability. For example, hospital admissions and emergency department visits for California are based on 2011 data. For mortality background incidence rates, the U.S. EPA obtained data for 2012-2014 from the Centers for Disease Control WONDER database[12], and generated age-, cause-, and county-specific mortality rates as described in the BenMAP manual.

The estimated background health incidences of mean ozone annual health effects across the San Joaquin Valley are shown in Table 3.3-9.[13],[14] The background health incidences provide an estimate of the average number of people over a given population that suffer from some adverse health effect over a given period. For example, the background health incidence in the San Joaquin Valley for total asthma-related emergency room visits for adults is 11,039 per year; this represents approximately 0.3% of the population as experiencing such incidents each year. Therefore, as shown in Table 3.3-9, the background health incidents for various ozone-related health endpoints is less than one percent for each of the health endpoints studied. This represents a relatively low rate of health incidents from cumulative regional ozone emissions, when compared to the population.

[12] See: http://wonder.cdc.gov

[13] As provided for the San Joaquin Valley for Year 2025, as prepared by Ramboll U.S. Consulting Inc. in their *Analysis of Potential Health Effects of Criteria Air Pollutant Emission Impacts, North Manteca Annexation #1 Project*, March 2023.

[14] Note: Although the Ramboll U.S. Consulting Inc. analysis for was prepared for a different project, the background health incidence rates are not project-specific. Rather, they are for the San Joaquin Valley as a whole for year 2025, and therefore are also provide a representative data snapshot for this project.

TABLE 3.3-9: BENMAP-ESTIMATED ANNUAL MEAN OZONE HEALTH EFFECTS OF THE PROJECT EMISSIONS ACROSS THE SAN JOAQUIN VALLEY MODEL DOMAIN[1]

HEALTH ENDPOINT[2]	*BACKGROUND HEALTH INCIDENCE (ANNUAL)*	*SAN JOAQUIN VALLEY POPULATION[15]*	*PERCENTAGE OF BACKGROUND HEALTH INCIDENTS AS A PROPORTION OF POPULATION*
HOSPITAL ADMISSIONS, ALL RESPIRATORY [65-99]	35,103	4,300,000	0.8%
MORTALITY, RESPIRATORY [30-99]	11,222	4,300,000	0.3%
EMERGENCY ROOM VISITS, ASTHMA [0-17]	11,039	4,300,000	0.3%
EMERGENCY ROOM VISITS, ASTHMA [18-99]	25,345	4,300,000	0.6%

NOTES: [1]HEALTH EFFECTS ARE SHOWN TERMS OF INCIDENCES OF EACH HEALTH ENDPOINT AND HOW IT COMPARES TO THE BASE VALUES. YEAR 2025 IS USED FOR BASE YEAR HEALTH EFFECT INCIDENCES, OR "BACKGROUND HEALTH INCIDENCE". HEALTH EFFECTS AND BACKGROUND HEALTH INCIDENCES ARE ACROSS THE SAN JOAQUIN VALLEY MODEL DOMAIN.[2] AFFECTED AGE RANGES ARE SHOWN IN SQUARE BRACKETS.
SOURCE: RAMBOLL, 2023.

The Project would generate emissions of ROG and NOx during Project operational activities, as shown in Table 3.3-8. Increases in ROG and NOx could affect people with impaired respiratory systems, but also healthy adults and children. Both Project NOx and ROG would not exceed the applicable air district criteria pollutant thresholds. The increases in ROG would be primarily due to the operational mobile vehicles generated by the Project, but also due to the use of consumer products (such as cleaning supplies, kitchen aerosols, cosmetics, and toiletries) by residents of the Project site. Consumer products are known to generate ROG through off-gassing. Such increases in ROG could fuel potential increases in health effects due to exposure to ozone. ROG emissions are anticipated to be reduced over time with anticipated shifts to electric vehicles as a proportion of the overall mobile vehicle fleet over time. Furthermore, as shown in Table 3.3-9, health-related incidences associated with ozone are relatively low in the San Joaquin Valley, as a proportion of the overall population.

Particulate Matter

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO_2) and laboratory studies of animals and humans, PM can cause major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis, and premature death. The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly, and children.

Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung

[15] See: https://www.ppic.org/blog/2020-census-counting-the-san-joaquin-valley/

function, and increased respiratory symptoms. Studies show that every 1 microgram per cubic meter reduction in $PM_{2.5}$ results in a one percent reduction in mortality rate for individuals over 30 years old (Bay Area Air Quality Management District, 2017). Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis – and even premature death. Additionally, depending on its composition, both PM_{10} and $PM_{2.5}$ can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (U.S. EPA 2019c).

The Project would generate emissions of PM during Project operational activities, as shown in Table 3.3-8. Although the exact effects of such emissions on local health are not known, it is likely that the increases in PM generated by the proposed Project would be minimal, even for people with impaired respiratory systems, located in the immediate vicinity of the Project site. The increases of these pollutants generated by the proposed Project would not on their own generate an increase in the number of days exceeding the NAAQS or CAAQS standards. In addition, based on the nature of the Project and its size, such emissions when combined with the existing PM emitted regionally would have minimal health effect on people located in the immediate vicinity of the Project site.

UFPs are a subset of PM and represent a health concern. Such particles have been shown to have the potential for even greater health effects than PM_{10} or $PM_{2.5}$, due to their even smaller particle sizes. However, there are no adopted rules or regulations by the U.S. EPA or California air districts regarding UFPs. Moreover, attainment status related to UFPs is not monitored by the U.S. EPA or California air districts, and the SJVAPCD does not provide any guidance for assessment, thresholds, or mitigation associated with UFPs. Additionally, air districts are not required to monitor UFPs. Nevertheless, funding for harm reduction and monitoring of UFPs is occurring throughout California. For example, the Bay Area Air Quality Management District (BAAQMD), a neighboring air district, established in 2011 a comprehensive program to study UFPs. As part of this program, the BAAQMD began making measurements at four air monitoring stations, with additional monitoring stations expected to be online in the future. At each station, the number of particles in a specified volume of air is counted every second. In addition to the number counts, sampling began in 2015 at two stations to gather data on UFP composition. Collected samples are analyzed for nineteen metals. Data obtained from these measurements is used to identify major UFP sources in the San Francisco Bay Area, and to evaluate models and refine estimates of UFP's public health impact.[16] Separately, the SJVAPCD provides grant funding for off-road engine projects through their grants and incentives programs, which reduce UFPs[17]; the U.S. EPA Pacific Southwest region has provided funding for both the South Coast Air Quality Management District and the SJVAPCD District to help spur early-stage, innovative technologies that need further testing and demonstration prior to massive deployment and commercialization of California Clean Air Initiative (CATI) projects.[18] Examples of such projects include Hybrid Natural Gas-Electric and Fully Electric Class 8 Trucks, Zero Emission Heavy-Duty

[16] See: https://www.baaqmd.gov/about-air-quality/air-quality-measurement/special-air-monitoring-projects/special-reports/ultrafine-particulate-matter?sc_lang=en&switch_lang=true
[17] See: https://ww2.valleyair.org/grants/
[18] See: https://www.epa.gov/cati/california-clean-air-technology-initiative-cati-projects

Electric Trucks, Zero- and Near-Zero Emission School Buses, Electric Delivery Trucks, and School Bus Air Filtration. Other, numerous efforts are underway throughout the state to reduce PM emissions, which also tend to reduce emissions of UFPs (since UFPs are a subset of PM).

Different sources of PM generate differing levels of UFPs. For example, almost all the PM emitted by natural gas combustion is in the $PM_{0.1}$ size fraction, whereas this is only true for less than half of the PM emitted by gasoline and diesel fuel combustion.[19] Therefore, estimating $PM_{0.1}$ can be difficult, given that it is not incorporated into the modeling software recommended by the CARB and the California air districts (i.e. CalEEMod). Nevertheless, a numerical estimate of the Project's $PM_{0.1}$ is provided under Impact 3.3-4, based on assumptions provided in available literature.

Discussion

It is well documented from scientific studies that criteria pollutants can have adverse health effects. The federal and state governments have established the NAAQS or CAAQS as an attempt to regionally, and cumulatively, assess and control the health effects that criteria pollutants have within Air Basins. It is anticipated that public health will continue to be affected by the emission of criteria pollutants, especially by those with impaired respiratory systems in the City of Lathrop and the surrounding region so long as the region does not attain the CAAQS or NAAQS. Many of the Project's criteria pollutant emissions are above the SJVAPCD's thresholds of significance, that were established to enable the Air Basin to achieve attainment for the NAAQS and CAAQS standards. As such, the Project emissions would be considered a cumulatively considerable contribution.

CONCLUSION

As shown in Table 3.3-8, the proposed Project's operational criteria pollutant would not exceed the applicable SJVAPCD thresholds of significance for all criteria air pollutants. Therefore, the Project's criteria air pollutant emissions would be considered to be ***less than significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.3-2: Proposed Project construction activities would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment, or conflict or obstruct implementation of the District's air quality plan. (Less than Significant)

Emissions from construction activities represent temporary impacts that are typically short in duration, depending on the size, phasing, and type of project. Air quality impacts can nevertheless

[19] Venecek, M. A., Yu, X., and Kleeman, M. J.: Predicted ultrafine particulate matter source contribution across the continental United States during summertime air pollution events, Atmos. Chem. Phys., 19, 9399–9412, https://doi.org/10.5194/acp-19-9399-2019, 2019.

be acute during construction periods, resulting in significant localized impacts to air quality. Construction-related activities would result in Project-generated emissions from demolition, site preparation, grading, paving, building construction, and architectural coatings. CalEEModTM (v.2022.1) was used to estimate construction emissions for the proposed Project. Table 3.3-10, below, provides the construction criteria pollutant emissions associated with implementation of the proposed Project.

TABLE 3.3-10: MAXIMUM CONSTRUCTION PROJECT GENERATED EMISSIONS (TONS PER YEAR)

POLLUTANT	CO	NO_X	ROG	SO_X	PM_{10}	$PM_{2.5}$
THRESHOLD	100	10	10	27	15	15
EMISSIONS	4.11	2.47	4.83	<0.1	1.07	0.53
EXCEEDS THRESHOLD?	**N**	**N**	**N**	**N**	**N**	**N**

SOURCES: CALEEMOD (V.2022.1)

NOTE: EMISSIONS AS SHOWN ABOVE INCLUDE THE EMISSIONS REDUCTIONS ASSOCIATED WITH THE DUST CONTROL PRACTICES, AS REQUIRED BY THE SJVAPCD.

If the proposed Project's emissions will exceed the SJVAPCD's threshold of significance for construction-generated emissions, the proposed Project will have a significant impact on air quality and conflict with the Clean Air Plan and all feasible mitigation are required to be implemented to reduce emissions. As shown in Table 3.3-10, Project maximum construction emissions would not exceed the SJVAPCD thresholds of significance for any criteria pollutants. Nevertheless, regardless of emission quantities, the SJVAPCD requires construction related control measures in accordance with their rules and regulations. Implementation of these control measures (provided in further detail below) would further reduce proposed Project construction related emissions to the extent possible.

The first step is to prepare a Dust Control Plan that meets all of the applicable requirements of APCD Rule 8021. All construction activities are required to implement dust control measures, as required by APCD Rules 8011-8081, to limit Visible Dust Emissions to 20% opacity or less. Dust control measures include application of water or chemical dust suppressants to unpaved roads and graded areas, covering or stabilization of transported bulk materials, prevention of carryout or trackout of soil materials to public roads, limiting the area subject to soil disturbance, construction of wind barriers, access restrictions to inactive sites as required by the applicable rules. The following dust control practices are identified in Tables 6-2 and 6-3 of the GAMAQI (2002):

a. *All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, or vegetative ground cover.*
b. *All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.*
c. *All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall control fugitive dust emissions by application of water or by presoaking.*
d. *When materials are transported off-site, all material shall be covered, effectively wetted to*

limit visible dust emissions, or at least six inches of freeboard space from the top of the container shall be maintained.

e. *All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours when operations are occurring. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.*

f. *Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.*

g. *Limit traffic speeds on unpaved roads to 15 mph.*

h. *Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.*

The proposed Project would comply with pre-existing requisite federal, State, SJVAPCD, and other local regulations and requirements, as well as implement the control measures provided by the SJVAPCD for construction-related PM_{10} emissions.

CONCLUSION

The proposed Project would comply with pre-existing requisite federal, State, SJVAPCD, and other local regulations and requirements. Moreover, the Project would not exceed the SJVAPCD's threshold of significance for construction-generated emissions. Therefore, the Project's criteria pollutant emissions would be considered to have a ***less than significant*** impact to this environmental topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.3-3: The proposed Project would not generate carbon monoxide hotspot impacts. (Less than Significant)

Very high levels of CO are not likely to occur outdoors. However, when CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease. These people already have a reduced ability for getting oxygenated blood to their hearts in situations where the heart needs more oxygen than usual. They are especially vulnerable to the effects of CO when exercising or under increased stress. In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain also known as angina (U.S. EPA, 2016). Such acute effects may occur under current ambient conditions for some sensitive individuals, while increases in ambient CO levels could increase the risk of such incidences.

The Project site is in a state attainment area and a federal unclassified/attainment area for carbon monoxide. Increases in proposed Project VMT would increase concentrations of carbon monoxide (CO) along streets and intersections that provide access to the Project site. Carbon monoxide is a local pollutant (i.e., high concentrations are normally only found very near sources) and can form local elevated concentrations under specific conditions. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations (i.e., hotspots), therefore, are usually only found near areas of very high traffic volume and congestion.

Consider the CO "hot spot" analysis conducted by the South Coast Air Quality Management District (SCAQMD) for their request to the USEPA for resignation as a CO attainment area (SCAQMD 2003). In SCAQMD's analysis, they modeled the four (4) most congested intersections identified in their basin (South Coast Air Basin [SCAB]), which included the following:

- Long Beach Boulevard and Imperial Highway – proximity to the Lynwood monitoring station, which consistently records the highest 8-hour CO concentrations in the SCAB each year.
- Wilshire Boulevard and Veteran Avenue – the most congested intersection in Los Angeles County, with an average daily traffic volume of 100,000 vehicles/day.
- Highland Avenue and Sunset Boulevard – one of the most congested intersections in the City of Los Angeles.
- Century Boulevard and La Cienega Boulevard – one of the most congested intersections in the City of Los Angeles.

The SCAQMD's analysis found that these intersections had an average 7.7 ppm 1-hour CO concentrations predicted by the models, which is only 38.5% of the 1-hour CO CAAQS of 20 ppm. Therefore, even the most congested intersections in SCAQMD's air basin would not experience a CO "hot spot."

Several factors combine to make substantial concentrations of carbon monoxide unlikely. Existing physical constraints such as high-density, high-profile buildings or other obstructions that could prevent dispersion of carbon monoxide are largely absent. Predominant weather conditions in the area include air movement that would help facilitate carbon monoxide dispersion. Congested traffic conditions that otherwise could result in concentration of carbon monoxide would be of short duration. Further, under existing regulatory and legislative mandates, emissions volumes from all vehicle classes will continue to decline. Given these factors, substantial concentrations of carbon monoxide are not expected at or along any affected roadways or intersections. Finally, for the Project, there are no roadways/segments identified as deficient facilities under the worst-case traffic scenario that have an ADT greater than the 100,000 that was anticipated for the most congested intersection analyzed by SCAQMD and which still did not have a significant hotspot impact.[20]

[20] See: California Department of Transportation (Caltrans), Traffic Volumes. 2017 Traffic Volumes : Route 99.

CONCLUSION

This Project is in an area that is designated attainment and attainment/unclassified for carbon monoxide. Therefore, no Project-level conformity analysis is necessary for CO. Substantial concentrations of carbon monoxide are not expected at or along any streets or intersections affected by the development of the Project site. Therefore, there would be a ***less than significant*** impact related to the Project's potential to generate carbon monoxide hotspots.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.3-4: The proposed Project would not generate substantial public exposure to toxic air contaminants. (Less than Significant)

A toxic air contaminant (TAC) is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at very low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. EPA regulate 188 air toxics, also known as hazardous air pollutants. The U.S. EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources. In addition, the U.S. EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment. These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter.

The 2007 U.S. EPA rule requires controls that will dramatically decrease Mobile Source Air Toxics (MSAT) emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (VMT) increases by 145 percent, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050. California maintains stricter standards for clean fuels and emissions compared to the national standards, therefore it is expected that MSAT trends in California will decrease consistent with or more than the U.S. EPA's national projections.

The California Air Resources Board (CARB) published the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB, 2005) to provide information to local planners and decision-makers about land use compatibility issues associated with emissions from industrial, commercial, and mobile sources of air pollution. The CARB Handbook indicates that mobile sources continue to be the largest overall contributors to the State's air pollution problems, representing the greatest air pollution health risk to most Californians. The most serious pollutants on a statewide basis include diesel exhaust particulate matter (diesel PM), benzene, and 1,3-butadiene, all of which are emitted by motor vehicles. These mobile source air toxics are largely associated with freeways and high traffic roads. Non-mobile source air toxics are largely associated with industrial and commercial uses. Table 3.3-11 provides the California Air Resources Board minimum separation recommendations on siting sensitive land uses.

TABLE 3.3-11: CARB MINIMUM SEPARATION RECOMMENDATIONS ON SITING SENSITIVE LAND USES

SOURCE CATEGORY	*ADVISORY RECOMMENDATIONS*
Freeways and High-Traffic Roads	• Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	• Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). • Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	• Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. • Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	• Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the CARB on the status of pending analyses of health risks.
Refineries	• Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	• Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloro-ethylene	• Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. • Do not site new sensitive land uses in the same building with perc dry cleaning operations.
Gasoline Dispensing Facilities	• Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities.

SOURCES: AIR QUALITY AND LAND USE HANDBOOK: A COMMUNITY HEALTH PERSPECTIVE" (CARB 2005)

Residences are proposed as part of the Project, which are considered traditional sensitive receptors. However, no residences would be located within 500 feet of a freeway, urban road with 100,000 vehicles/day or more, or a rural road with 50,000 vehicles/day or more. Additionally, under CEQA, an EIR need not analyze the impacts of the existing environment on the Project.

Virtually no residual TAC emissions and corresponding cancer risk are anticipated after Project construction. The proposed Project is not anticipated to generate any notable long-term, operational sources of TAC emissions because the proposed Project would only include residential land uses, light commercial uses, and public open space. The Project would not include heavy industrial uses or other land uses typically associated with stationary sources of TACs.

It should be noted that the mobile vehicles generated by the Project during operation would generate UFPs through vehicle emissions, braking, and tire wear. Like PM in general, (though generating even higher risk per unit than larger particle sizes) UFPs are notable for their potential to generate chronic risks associated with cardiovascular disease, potential long-term loss of long-function, and cancer. According to a recent study prepared for the European Geosciences Union, UFPs vary widely as a proportion of PM overall, depending on location; specifically, the $PM_{0.1}$ to $PM_{2.5}$ ratio analyzed in approximately 39 cities in the United States varied from approximately 1% to 16%.[21] These factors vary so widely because the sources of $PM_{0.1}$ vary substantially from city to city. For example, cities that are located close to substantial sources of natural gas combustion have higher $PM_{0.1}$ to $PM_{2.5}$ ratios, since almost all the PM emitted by natural gas combustion is in the $PM_{0.1}$ size fraction, whereas this is only true for less than half of the PM emitted by gasoline and diesel fuel combustion. Taken together, these facts support the potential importance of natural gas combustion for ambient $PM_{0.1}$ concentrations.

The city analyzed in the study with the greatest similarity to the City of Lathrop (i.e. where the Project is located) was the City of Bakersfield, given its similarity in location within the Central Valley region. The ratio of $PM_{0.1}$ to $PM_{2.5}$ for Bakersfield was found to be approximately 11%. Absent data specific to the City of Lathrop, this data is presumed to be the best available data and reasonable for use in estimating $PM_{0.1}$ levels in this case. Therefore, given the Project's estimated 3.05 tons per year of $PM_{2.5}$ (see Table 3.3-8), the total $PM_{0.1}$ generated by the Project is estimated to be approximately 0.34 tons per year (671 lbs/year). This is equivalent to 1.84 lbs/day of $PM_{0.1}$. While there is not specifically a numerical threshold of significance established by the SJVAPCD for $PM_{0.1}$, the quantity estimated is considered small relative to thresholds established for other particulate matter. From an incremental health perspective, this level of UFPs generated by the Project would not be substantial. As such, the Project would not result in substantial UFP emissions that may affect nearby receptors.

Further, the Project would not be exposed to substantial nearby sources of TACs. Since the proposed Project would not site land uses that would generate a significant risk of public exposure to TACs, the proposed Project would have a ***less than significant*** impact relative to this topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

[21] Venecek, M. A., Yu, X., and Kleeman, M. J.: Predicted ultrafine particulate matter source contribution across the continental United States during summertime air pollution events, Atmos. Chem. Phys., 19, 9399–9412, https://doi.org/10.5194/acp-19-9399-2019, 2019.

MITIGATION MEASURE(S)

None required.

Impact 3.3-5: The proposed Project would not cause exposure to other emissions (such as those leading to odors) adversely affecting a substantial number of people. (Less than Significant)

The following text addresses odors. Other emissions (including criteria pollutants and TACs) are addressed in Impacts 3.3-1 through 3.3-4.

While offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the SJVAPCD. The general nuisance rule (Health and Safety Code §41700) is the basis for the threshold.

Examples of facilities that are known producers of odors include: Wastewater Treatment Facilities, Chemical Manufacturing, Sanitary Landfill, Fiberglass Manufacturing, Transfer Station, Painting/Coating Operations (e.g. auto body shops), Composting Facility, Food Processing Facility, Petroleum Refinery, Feed Lot/Dairy, Asphalt Batch Plant, and Rendering Plant.

If a project proposes to locate receptors and known odor sources in proximity to each other, further analysis may be warranted. However, if a project would not locate receptors and known odor sources in proximity to each other, then further analysis is not warranted. The proposed Project does not include new industrial uses that are not already present in the vicinity of the Project site. Air district Rule 402 prohibits any mobile or stationary source generating an objectionable odor, except for odors emanating from certain agricultural operations. The California Health and Safety Code §41700 and Air District Rule 402 prohibit emissions of air contaminants from any source that cause nuisance or annoyance to a considerable number of people or that present a threat to public health or cause property damage. Compliance with these rules would preclude land uses proposed under the proposed Project from emitting objectionable odors.

Odors would be potentially generated from vehicle and equipment exhaust emissions during construction of the Project. Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application. Such odors would disperse rapidly from the Project site and generally occur at magnitudes that would not affect substantial numbers of people. Furthermore, SJVAPCD Rule 4641 limits the amount of VOC emissions from cutback asphalt. Thus, any potential odors generated during asphalt paving would be regulated through mandatory compliance with SJVAPCD rules. Therefore, impacts associated with odors during construction would be less than significant.

Land uses that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The Project would not include land uses that generate odors during operation. Therefore, Project operations would result in odor impacts that are less than significant.

CONCLUSION

The proposed Project does not propose uses that would create new odors that would adversely affect substantial numbers of people. Construction odors would be temporary, limited by compliance with SJVAPCD rules, and would not affect a substantial number of people. Therefore, construction and operation of the proposed Project would not result in significant objectionable odors. Impacts associated with exposure to odors would be ***less than significant.***

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

This page left intentionally blank.

This section describes the geomorphic provinces/bioregions, vegetation, wildlife, soils, hydrogeomorphic features, wetlands, special-status species, regulatory setting, and impacts that are expected on biological resources. This section is based in part on the following: *Draft Environmental Impact Report for the Lathrop General Plan Update* (City of Lathrop, 2022), the *City of Lathrop General Plan* (City of Lathrop, 2022)*,* as well as a site specific surveys and analysis for the Project site.

One comment was received from the San Joaquin Council of Governments (SJCOG) (December 27, 2022). during the Notice of Preparation (NOP) scoping process related to this environmental topic. Full comments received are included in Appendix A.

Methods

PRE-FIELD INVESTIGATION

Prior to the field investigation, numerous maps, databases, and reports were reviewed including:

- U.S. Geological Survey (USGS) 7.5-minute Quadrangle
- USGS National Hydrography Data Set
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps
- National Resource Conservation Service (NRCS) Soil Survey
- California Wildlife Habitat Relationships (CWHR) maps
- California Natural Diversity Database (CNDDB)
- California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants
- U.S. Fish and Wildlife Service's (USFWS) IPac
- U.S. Fish and Wildlife Service's (USFWS) Official List

FIELD SURVEY

The Project site was subject to a field survey by Principal Biologist Steve McMurtry on July 13, 2022 and April 15, 2023. The parcels surveyed include Assessor's Parcel Numbers (APNs) 191-190-74, 191-190-75, 191-190-76, 191-190-77, 191-190-78, 191-340-03, 191-610-02, 191-610-22, 191-620-50, and 191-620-59. The surveys served several purposes. First, they served as reconnaissance of the site to establish the existing conditions of the site and to verify information gathered in the pre-field investigation. This included identification of the habitat types, hydrologic features, topography, soil characteristics, vegetation. The field investigations followed the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009). Field investigations were performed during the floristic period for species in the region. Field investigations were performed on foot using transects. Habitat was recorded, and the Project site was inspected for the presence, or potential for presence of wildlife. The area was inspected for its upland and aquatic habitat functions. The field investigations coincided with the optimal period for observing nesting birds, breeding amphibians, and active reptiles. The Project site was also examined for evidence of scat and tracks of mammals. The surveys spanned multiple growing seasons, so condition of the fields ranged from recently tilled agricultural fields, to early growth of crop. Orchards ranged from dormant to early growth. Visibility during each survey was excellent.

FIELD TOOLS/EQUIPMENT

Tools used during the field investigations included a Trimble GeoExplorer XH Handheld (sub-foot unit), 30-meter tape measure, diameter tape, spade, Munsell color chart, Vortex 20-60x80 spotting scope, and Swarovski 10x42 binoculars.

3.4.1 ENVIRONMENTAL SETTING

GEOMORPHIC PROVINCE/BIOREGION

The City of Lathrop is in the southern portion of the Great Valley Geomorphic Province of California. The Great Valley Province is a broad structural trough bounded by the tilted block of the Sierra Nevada on the east and the complexly folded and faulted Coast Ranges on the west. The Stanislaus River is located just north of the City. This is a tributary of the San Joaquin River, which drains the Great Valley Province into the San Joaquin Delta to the north, ultimately discharging into the San Francisco Bay to the northwest.

The City of Lathrop is located within the Bay Area/Delta Bioregion. The Bay Area/Delta Bioregion extends from the Pacific Ocean to the Sacramento Valley and San Joaquin Valley bioregions to the northeast and southeast, and a short stretch of the eastern boundary joins the Sierra Bioregion at Amador and Calaveras Counties. The bioregion is bounded by the Klamath/North Coast on the north and the Central Coast Bioregion to the south. The Bay Area/Delta Bioregion is one of the most populous areas of the state, encompassing the San Francisco Bay Area and the Sacramento-San Joaquin River Delta. The water that flows through the Delta supplies two-thirds of California's drinking water, irrigating farmland, and sustaining fish and wildlife and their habitat. The bioregion fans out from San Francisco Bay in a jagged semi-circle that takes in all or part of 12 counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Joaquin, San Mateo, Santa Clara, Solano, Sonoma, and parts of Sacramento and Yolo. The habitats and vegetation of the Bay Area/Delta Bioregion are as varied as the geography.

LOCAL SETTING

Location

The Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site) is located within the West Lathrop Specific Plan (WLSP) area in the City of Lathrop, San Joaquin County, California (Figures 2.0-1 and 2.0-2 in Chapter 2.0). The site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south.

The Project site includes two distinct planning boundaries defined below. The following terms are used throughout this Draft EIR to describe the planning boundaries within the Project site:

- **Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site)** – totals 225.86 acres and includes the whole of the Project, including the proposed 167.42-acre Development Area, and land along the San Joaquin River (which would not be developed as part of the proposed Project).

- **Development Area** – includes 167.42 acres that is intended for development.

Topography

The elevation of the site is generally flat and ranges from approximately 14 feet to 21 feet above mean sea level (MSL). Most of the site is flat, with slopes existing along the San Joaquin River.

Climate

The summer climate is hot and sub-humid with warm, dry summers, and cool, moist winters. In the entire San Joaquin Valley Air Basin (SJVAB), daily summer high temperatures average 95 degrees. Over the last 30 years, temperatures in the SJVAB averaged 90 degrees or higher for 106 days a year, and 100 degrees or higher for 40 days a year.

The daily summer temperature variation can be as high as 30 degrees. In winter, the Pacific high-pressure cell weakens and shifts southward, resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Average high temperatures in the winter are in the 50s, but lows in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low winter temperature is 45 degrees. The average rainfall is approximately 12.1 inches and occurs during winter storms.

Existing Uses

The majority of the Plan Area is currently undeveloped (Figure 2.0-4). There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

Surrounding Uses

Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed-use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

Vegetation

The majority of the Development Area contains agricultural uses with row crops and fields. The agricultural crops and fields are mostly bare, tilled and fallow after seasonal harvest. Typical invasive weeds and plants such as wild radish, datura, goats-head, brome and Russian thistle were present around the perimeter of the agricultural fiends and along edges of dirt access roads. Native valley oaks are present in several places along the Project site boundaries and near the building complex. Ornamental imported trees are also found near the barns and house.

Wildlife

Vegetation found in the Project site provides habitat for both common and a few special-status wildlife populations. For example, some commonly observed wildlife species in the region include: California ground squirrel (*Spermophilus beecheyi*), California vole (*Microtus californicus*), coyote

(*Canis latrans*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus),* American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), American killdeer (*Charadrius vociferus*), gopher snake (*Pituophis melanoleucus*), garter snake (*Thamnophis species*), and western fence lizard (*Sceloporus occidentalis*), as well as many native insect species. There are also several bat species in the region. Bats often feed on insects as they fly over agricultural and natural areas.

Locally common and abundant wildlife species are important components of the ecosystem. Due to habitat loss, many of these species must continually adapt to using agricultural, ruderal, and ornamental vegetation for cover, foraging, dispersal, and nesting.

Plant Communities

Agricultural and natural plant communities provide habitat for a variety of biological resources in the region. Sensitive habitats include those that are of special concern to resource agencies or those that are protected under a Habitat Conservation Plan, Natural Community Conservation Plan, the California Environmental Quality Act (CEQA), the Fish and Game Code, or the Clean Water Act (CWA). Additionally, sensitive habitats are sometimes protected under specific policies from local agencies. Figure 3.4-1 shows the plant communities (land cover types). Table 3.4-1 summarizes the plant communities (land cover types) by acreage.

TABLE 3.4-1: LAND COVER TYPES

LAND COVER TYPE	*ACREAGE*		
	DEVELOPMENT AREA	*UNDEVELOPED AREA*	*PROJECT SITE*
Annual Grassland	0.70	24.86	25.56
Barren	1.06	0.45	1.51
Coastal Scrub	-	1.50	1.50
Cropland	1.70	1.56	3.26
Deciduous Orchard	0.21	0.02	0.22
Dryland Grain Crops	144.15	3.68	147.84
Irrigated Hayfield	3.08	1.63	4.71
Irrigated Row and Field Crops	0.22	-	0.22
Riverine	-	4.23	4.23
Urban	15.65	2.97	18.63
Valley Foothill Riparian	0.64	17.54	18.18
Grand Total	**167.42**	**58.44**	**225.86**

SOURCE: CALFIRE FRAP DATA; SAN JOAQUIN COUNTY GIS; 2024.

Soils

A Custom Soil Survey was completed for the Development Area using the NRCS Web Soil Survey program. The NRCS soils map is provided in Figure 3.6-1 in Section 3.6, Geology and Soils. Table 3.4-2 identifies the type and range of soils found in the Project site.

TABLE 3.4-2: PROJECT SITE SOILS

UNIT SYMBOL	*NAME*	*ACRES IN PROJECT SITE*	*GRAND TOTAL*
130	Columbia fine sandy loam, drained, 0 to 2 percent slopes, MLRA 17	0.3	0.2%
148	Dello clay loam, drained, 0 to 2 percent slopes, overwashed	19.9	11.9%
153	Egbert silty clay loam, partially drained, 0 to 2 percent slopes, MLRA 16	26.5	15.8%
197	Merritt silty clay loam, partially drained, 0 to 2 percent slopes	120.7	72.1%

SOURCE: NRCS USA SOILS, ACCESSED 3-8-2024; SAN JOAQUIN COUNTY GIS. MAP DATE: MARCH 11, 2024.

Aquatic Resources

Agricultural ditches, which are ditches that drain runoff from the agricultural fields, are located on-site. The agricultural ditches have been created along some of the agricultural fields to collect agricultural runoff. Additionally, the San Joaquin River and associated tributaries are located to the north, west, and south of the Project site.

SPECIAL-STATUS SPECIES

The following discussion is based on a background search of special-status species that are documented in the CNDDB, the CNPS Inventory of Rare and Endangered Plants, and the USFWS records of listed endangered and threatened species from the IPAC database. The background search was regional in scope and focused on the documented occurrences within the Specific Plan Area's 9-quadrangle region (i.e., Lathrop, Holt, Stockton West, Stockton East, Union Island, Manteca, Tracy, Vernalis, and Ripon U.S. Geological Survey quadrangles). Table 3.4-3 provides a list of special-status plants and Table 3.4-4 provides a list of special-status animals.

TABLE 3.4-3: SPECIAL-STATUS PLANT SPECIES WHICH MAY OCCUR IN PROJECT AREA

SPECIES	*STATUS (FED./CA/ CNPS/SJMSCP)*	*GEOGRAPHIC DISTRIBUTION*	*HABITAT AND BLOOMING PERIOD*	*PRESENCE DETERMINATION*
bristly sedge *Carex comosa*	--/--/2B.1/Yes	Occurrences exist in the following counties: Contra Costa, Modoc, San Joaquin, Yolo, Fresno, Sacramento, Santa Cruz, Lake, San Bernardino, Shasta, Mendocino, San Francisco, and Sonoma	Marshes and swamps, coastal prairie, valley and foothill grassland. Lake margins, wet places; site below sea level is on a Delta island. -5-1,010 m.	Not expected to occur; no suitable habitat.
Large-flowered fiddleneck *Amsinckia grandiflora*	E/E/1B.1/Yes	Native to California found in Contra Costa, Alameda, and San Joaquin Counties	Found in grasslands; it grows on sedimentary loam in mesic areas of its range. April - May	Not expected to occur; no CNDDB records within 15 miles of the site.
alkali-sink goldfields *Lasthenia chrysantha*	--/--/1B.1/No	Sacramento Valley, San Joaquin Valley	Vernal pools. Alkaline. 0-200 m. Feb-April.	Not expected to occur; no suitable habitat.
Alkali milk-vetch *Astragalus tener var. tener*	--/--/1B.2/Yes	Eastern San Francisco Bay region, the Delta, and western San Joaquin Valley south to the lower Salinas and San Benito valleys	Grassy alkaline flats and vernally moist meadows at elevations below 500 ft. March-June	Not expected to occur; no suitable habitat.
Heartscale *Atriplex cordulata var. cordulata*	--/--/1B.2/Yes	Central Valley and interior valleys of the Coast Range from Butte to Kern counties.	Saline or alkaline sandy soils in grassland or saltbush scrub. March-October	Not expected to occur; no suitable habitat and no CNDDB records within 8 miles of the site.
Lesser saltscale *Atriplex minuscula*	--/--/1B.1/No	Scattered locations in the Central Valley in Alameda, Butte, Fresno, Kings, Kern, Madera, Merced, Stanislaus, Tulare counties	Alkaline, sandy soils. Chenopod scrub, playas, valley and foothill grassland. May-October	Not expected to occur; no CNDDB occurrences within 13 miles.
Big tarplant *Blepharizonia plumosa*	--/--/1B.1/No	San Francisco Bay area with occurrences in Alameda, Contra Costa, San Joaquin, Stanislaus, and Solano Counties	Valley and foothill grassland; 30-505 m. July-Oct.	Not expected to occur; no suitable habitat and no CNDDB records within 7 miles of the site.
Palmate-bracted bird's-beak *Chloropyron palmatum*	E/E/1B.1/No	Scattered locations in Fresno and Madera counties in the San Joaquin Valley, San Joaquin, Yolo, and Colusa counties in the Sacramento Valley, and the Livermore Valley area of Alameda County	Saline-alkaline soils in seasonally-flooded lowland plains and basins at elevations of less than 500 feet. May-October	Not expected to occur; no CNDDB occurrences within 9 miles.
Recurved larkspur *Delphinium recurvatum*	--/--/1B.2/Yes	Central Valley from Colusa to Kern Counties	Alkaline soils in saltbush scrub, cismontane woodland, valley and foothill grassland; 3-750 m. March – May.	Not expected to occur; no suitable habitat and no CNDDB records within 9 miles of the site.

Species	*Status (Fed./CA/ CNPS/SJMSCP)*	*Geographic Distribution*	*Habitat and Blooming Period*	*Presence Determination*
diamond-petaled California poppy *Eschscholzia rhombipetala*	--/--/1B.1/Yes	Interior foothills of south Coast Ranges from Contra Costa to Stanislaus Counties, Carrizo Plain in San Luis Obispo County	Grassland, chenopod scrub, on clay soils where grass cover is sparse enough to allow growth of low annuals; below 975 m. March-April	Not expected to occur; no suitable habitat.
San Joaquin spearscale *Extriplex joaquinana*	--/--/1B.2/No	Delta region, central valley and central coast	Alkaline. Chenopod scrub, meadows and seeps, playas, valley and foothill grassland. April-October	Not expected to occur; CNDDB records within 9 miles of the site.
Sanford's arrowhead *Sagittaria sanfordii*	--/--/1B.2/Yes	Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Marin, Napa, Orange, Placer, Sacramento, San Bernardino, Shasta, San Joaquin, Solano, Tehama, Tulare, Ventura, and Yuba Counties	Marshes and swamps. In standing or slow-moving freshwater ponds, marshes, and ditches. 0-605 m. May-October (November).	Not expected to occur; no suitable habitat.
Woolly rose-mallow *Hibiscus lasiocarpos var. occidentalis*	--/--/1B.2/Yes	Central Valley of California, as well as populations in eastern North America	All along the waterways of the Delta. June-September	Not expected to occur; no suitable habitat.
Wright's trichocoronis *Trichocoronis wrightii var. wrightii*	--/--/2B.1/Yes	Butte, Del Norte, El Dorado, Fresno, Merced, Mariposa, Marin, Napa, Orange, Placer, Sacramento, San Bernardino, Shasta, San Joaquin, Solano, Tehama, Tulare, Ventura, and Yuba Counties	Marshes and swamps. In standing or slow-moving freshwater ponds, marshes, and ditches. 0-605 m. May-October (November).	Not expected to occur; no suitable habitat.
Mason's lilaeopsis *Lilaeopsis masonii*	--/R/1B.1/Yes	Sacramento-San Joaquin River Delta and nearby shores of San Francisco Bay.	Marshes and swamps, riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or river bank erosion. In brackish or freshwater. 0-10 m. Apr-Nov.	Not expected to occur; no suitable habitat.
Delta mudwort *Limosella australis*	--/--/2B.1/Yes	Found in Contra Costa County, Sacramento County, San Joaquin County, and Solano County.	Riparian scrub, marshes, and swamps. Usually on mud banks of the Delta in marshy or scrubby riparian associations; often with *Lilaeopsis masonii*. 0-5 m. May-Aug.	Not expected to occur; no suitable habitat.
Delta button-celery *Eryngium racemosum*	--/E/1B.1/Yes	San Joaquin River delta floodplains and adjacent Sierra Nevada foothills: Calaveras, Merced, San Joaquin, and Stanislaus Counties	Riparian scrub, seasonally inundated depressions along floodplains on clay soils; below 75 m. June-August.	Not expected to occur; no suitable habitat.
Delta tule pea *Lathyrus jepsonii var. jepsonii*	--/--/1B.2/Yes	Sacramento Valley, the San Joaquin Valley and SF Bay regions	Marshes and swamps. In freshwater and brackish marshes. Often found with Typha, Aster lentus, Rosa californica, Juncus spp., Scirpus, etc. Usually on marsh and slough edges. 0-5 m. May-July.	Not expected to occur; no suitable habitat.
slough thistle *Cirsium crassicaule*	--/--/1B.1/Yes	San Joaquin Valley: Kings, Kern, and San Joaquin Counties	Freshwater sloughs and marshes; 3-100 m. May-August.	Not expected to occur; no suitable habitat.

SPECIES	STATUS (FED./CA/ CNPS/SJMSCP)	GEOGRAPHIC DISTRIBUTION	HABITAT AND BLOOMING PERIOD	PRESENCE DETERMINATION
Suisun Marsh aster *Symphyotrichum lentum*	--/--/1B.2/Yes	Contra Costa, Napa, Sacramento, San Joaquin, Solano, and Yolo Counties	Marshes and swamps (brackish and freshwater). Most often seen along sloughs with Phragmites, Scirpus, blackberry, Typha, etc. 0-15 m. (April) May-November.	Not expected to occur; no suitable habitat.
Showy golden madia *Madia radiata*	--/--/1B.1/Yes	It is endemic to California, where it is known mostly from the Central Coast Ranges and adjacent edges of the San Francisco Bay Area and Central Valley.	Valley and foothill grassland, cismontane woodland. Mostly on adobe clay in grassland or among shrubs. 75-1220 m. Mar-May.	Not expected to occur; outside elevation range.
California alkali grass *Puccinellia simplex*	--/--/1B.2/No	Located throughout California, Oregon, and Utah. Occurrences in Alameda, Butte, Contra Costa, Fresno, Glenn, Kings, Kern, Lake, Los Angeles, Madera, Merced, Napa, San Bernardino, Santa Clara, Santa Cruz, San Luis Obispo, Solano, Stanislaus, Tulare, and Yolo Counties.	Alkaline, vernally mesic; sinks, flats, and lake margins. Chenopod scrub, meadows and seeps, valley and foothill grassland, vernal pools. 2 – 930 m. March – May.	Not expected to occur; no suitable habitat and no CNDDB records within 12 miles of the site.
Saline clover *Trifolium hydrophilum*	--/--/1B.2/No	Eastern and Northern San Francisco Bay region, the Delta, western San Joaquin Valley, southern San Jose	Marshes and swamps, valley and foothill grassland (mesic, alkaline), and vernal pools. April-June	Not expected to occur; no suitable habitat.
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	--/--/1B.1/Yes	Historically known from the northwest San Joaquin Valley and adjacent Coast Range foothills; currently known from Fresno, Monterey, and San Luis Obispo Counties	Alkaline hills in valley and foothill grassland; below 455 m. March-April.	Not expected to occur; one CNDDB record 1.0 miles east of the site.
watershield *Brasenia schreberi*	--/--/2B.3/No	Central Valley of California and western North America	Freshwater marshes and swamps. June-September.	Not expected to occur; no suitable habitat.

NOTES: THE PRESENCE DETERMINATIONS WERE MADE BY PRINCIPAL BIOLOGIST, STEVE MCMURTRY (DE NOVO PLANNING GROUP, 2022 AND 2023) AND ARE BASED ON THE SITE SURVEY, REVIEW OF ON-SITE HABITAT CONDITIONS, AND THE CNDDB RESULTS

CNPS = CALIFORNIA NATIVE PLANT SOCIETY
SJMSCP = SAN JOAQUIN MULTI-SPECIES HABITAT CONSERVATION AND OPEN SPACE PLAN
FEDERAL
E = ENDANGERED UNDER THE FEDERAL ENDANGERED SPECIES ACT.
T = THREATENED UNDER THE FEDERAL ENDANGERED SPECIES ACT.
STATE
E = ENDANGERED UNDER THE CALIFORNIA ENDANGERED SPECIES ACT.

CALIFORNIA NATIVE PLANT SOCIETY
1B = RARE, THREATENED, OR ENDANGERED IN CALIFORNIA AND ELSEWHERE.
2 = RARE, THREATENED, OR ENDANGERED IN CALIFORNIA, BUT MORE COMMON ELSEWHERE.
3 = A REVIEW LIST – PLANTS ABOUT WHICH MORE INFORMATION IS NEEDED.
4 = PLANTS OF LIMITED DISTRIBUTION – A WATCH LIST
.1 = SERIOUSLY ENDANGERED IN CALIFORNIA (OVER 80% OF OCCURRENCES THREATENED-HIGH DEGREE AND IMMEDIACY OF THREAT).
.2 = FAIRLY ENDANGERED IN CALIFORNIA (20-80% OCCURRENCES THREATENED).
.3 = NOT VERY ENDANGERED IN CALIFORNIA (<20% OF OCCURRENCES THREATENED).

TABLE 3.4-4: SPECIAL-STATUS WILDLIFE AND FISH SPECIES WHICH MAY OCCUR IN PROJECT AREA

SPECIES	*STATUS (FED/CA/ SJMSCP)*	*GEOGRAPHIC DISTRIBUTION*	*HABITAT REQUIREMENTS*	*PRESENCE DETERMINATION*
Invertebrates				
Vernal pool fairy shrimp *Branchinecta lynchi*	T/--/Yes	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also in Riverside County	Common in vernal pools; they are also found in sandstone rock outcrop pools.	No potential to occur. Habitat not present.
vernal pool tadpole shrimp *Lepidurus packardi*	E/--/Yes	Shasta County south to Merced County.	Vernal pools and ephemeral stock ponds.	No potential to occur. Habitat not present.
western ridged mussel *Gonidea angulata*	--/--/No	Extirpated throughout their original range in California, particularly in southern California and the Central Valley. They have also been extirpated from many sites in the Snake and Columbia watersheds.	Primarily creeks and rivers and less often lakes. Originally in most of state, now extirpated from Central and Southern California.	No potential to occur. Habitat not present.
California linderiella *Linderiella occidentalis*	--/--/No	Ranges from near Redding in the north to as far south as Fresno County, mainly to the east of the Sacramento and San Joaquin Rivers	Natural, and artificial, seasonally ponded habitat types including: vernal pools, swales, ephemeral drainages, stock ponds, reservoirs, ditches, backhoe pits, and ruts caused by vehicular activities	No potential to occur. Habitat not present.
Conservancy fairy shrimp *Branchinecta conservatio*	E/--/Yes	Sacramento Valley and the northern San Joaquin Valley, and the eastern flank of the central coastal range	Large to very large vernal pools and vernal lakes although they also have been found in alkaline pools	No potential to occur. Habitat not present.
Crotch bumble bee *Bombus crotchii*	--/--/No	Central California south to Baja California del Norte, Mexico, and includes coastal areas east to the edges of the deserts and the Central Valley	Open grassland and scrub	Low potential; No known CNDDB occurrences within 6 miles of Project site. Potential habitat limited, to non-existent within Project area.
Sacramento anthicid beetle *Anthicus sacramento*	--/--/No	Found in several locations along the Sacramento and San Joaquin rivers, from Shasta to San Joaquin counties, and at one site along the Feather River.	Sand dune area, sand slipfaces among bamboo and willow, but may not depend on these plants.	No potential to occur. Habitat not present.
San Joaquin Valley giant flower-loving fly *Rhaphiomidas*	--/--/ No	Historically known from, and endemic to, sandy soils of the San Joaquin Valley from Antioch Dunes in Contra Costa Co south to Sand Ridge in Kern Co.	Associated with sandy soils such as riverine deposits and sand dunes with relatively sparse vegetation. Adult flight from Jul to Oct and life span is about 3 days and do not visit	No potential to occur. Habitat not present.

SPECIES	*STATUS (FED/CA/ SJMSCP)*	*GEOGRAPHIC DISTRIBUTION*	*HABITAT REQUIREMENTS*	*PRESENCE DETERMINATION*
trochilus			flowers/nectar. Females deposit eggs in and on the surface of sandy soil. Larvae burrow in fine sands up to 10 feet deep and are known to live for 3 years prior to pupation.	
molestan blister beetle *Lytta moesta*	--/--/Yes	Distribution of this species is poorly known.	Annual grasslands, foothill woodlands or saltbush scrub.	No potential to occur. Habitat not present. No known CNDDB occurrences within 20 miles of Project site.
Western bumble bee *Bombus occidentalis*	T/--/No	Western North America, ranging from the tundra region in Alaska and Yukon south along the west coast to southern British Columbia to central California, Arizona and New Mexico and east into southern Saskatchewan and northwestern Great Plains	Open coniferous, deciduous and mixed-wood forests, wet and dry meadows, montane meadows and prairie grasslands, meadows bordering riparian zones, and along roadsides in taiga adjacent to wooded areas, urban parks, gardens and agricultural areas, subalpine habitats and more isolated natural areas	No potential to occur. Habitat not present. The nearest CNDDB occurrence is 0.25 miles or further south of the site.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	T/--/Yes	Stream side habitats below 3,000 feet throughout the Central Valley	Riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant.	Low potential; No known CNDDB occurrences within 3 miles of Project site. Potential habitat limited, to non-existent within Project area.
Amphibians				
California tiger salamander *Ambystoma californiense (A. tigrinum c.)*	T/SSC/Yes	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Butte County south to northeastern San Luis Obispo County.	Small ponds, lakes, or vernal pools in grass-lands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy.	No potential to occur. Habitat not present.
Foothill yellow-legged frog *Rana boylii*	--/C (SSC)/Yes	Occurs in the Klamath, Cascade, north Coast, south Coast, Transverse, and Sierra Nevada Ranges up to approximately 6,000 feet	Creeks or rivers in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along the edge. Usually found near riffles with rocks and sunny banks nearby.	No potential to occur. Habitat not present.
California red-legged frog *Rana aurora draytoni*	T/SSC/Yes	Found along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County	Permanent and semi-permanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation. May estivate in rodent burrows or cracks during dry periods.	No potential to occur. Habitat not present.

SPECIES	*STATUS (FED/CA/ SJMSCP)*	*GEOGRAPHIC DISTRIBUTION*	*HABITAT REQUIREMENTS*	*PRESENCE DETERMINATION*
Western spadefoot *Spea hammondii*	T/SSC/Yes	Found along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County	Permanent and semi-permanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation. May estivate in rodent burrows or cracks during dry periods.	No potential to occur. Habitat not present.
Birds				
cackling (=Aleutian Canada) goose *Branta hutchinsii leucopareia*	--/WL/Yes	The entire population winters in Butte Sink, then moves to Los Banos, Modesto, the Delta, and East Bay reservoirs; stages near Crescent City during spring before migrating to breeding grounds.	Roosts in large marshes, flooded fields, stock ponds, and reservoirs; forages in pastures, meadows, and harvested grainfields; corn is especially preferred.	Habitat present (ditches and fields), none observed. Regionally common.
California black rail *Laterallus jamaicensis coturniculus*	--/T(WL)/ Yes	Permanent resident in the San Francisco Bay and east-ward through the Delta into Sacramento and San Joaquin Counties; small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial Counties	Tidal salt marshes associated with heavy growth of pickleweed; also occurs in brackish marshes or freshwater marshes at low elevations	No potential to occur. Habitat not present. No known CNDDB occurrences within 11 miles of Project site.
Tricolored blackbird *Agelaius tricolor*	BCC/C (SSC)/Yes	Permanent resident in the Central Valley from Butte County to Kern County. Breeds at scattered coastal locations from Marin County south to San Diego County; and at scattered locations in Lake, Sonoma, and Solano Counties. Rare nester in Siskiyou, Modoc, and Lassen Counties	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields. Habitat must be large enough to support 50 pairs. Probably requires water at or near the nesting colony	Low potential to occur; potential nesting and foraging habitat present within region, but not within the Project site. CNDDB occurrences within 2.3 miles of the site. Nesting opportunities are absent. Highly mobile species could pass through.
Burrowing owl *Athene cunicularia*	BCC/SSC/ Yes	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast	Level, open, dry, heavily grazed or low stature grassland or desert vegetation with available burrows	Moderate to high potential to occur. Suitable nesting and foraging habitat present on-site. Nearest CNDDB record is approximately 2.23 miles northeast or further. No active nesting observed. Highly mobile species could pass through and could establish nests in future years.
Swainson's hawk *Buteo swainsoni*	BCC/T/Yes	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods in or near riparian habitats. Forages in grasslands, irrigated pastures, and grain fields	High potential to occur. Suitable foraging and nesting habitat present on-site. There are three CNDDB records within 0.1-miles of site. Highly mobile species could pass

SPECIES	STATUS (FED/CA/ SJMSCP)	GEOGRAPHIC DISTRIBUTION	HABITAT REQUIREMENTS	PRESENCE DETERMINATION
				through.
White-tailed kite *Elanus leucurus*	--/--/Yes	Gulf Coast in Texas and Mexico and in the valley and coastal regions of central and southern California	Grasslands, marshes, row crops and alfalfa, where they hover while foraging for rodents and insects.	Moderate potential to occur. Suitable foraging habitat present on-site. There are no CNDDB record within 8 miles of the site. Nesting opportunities are present. Highly mobile species could pass through.
California horned lark *Eremophila alpestris actia*	--/--/Yes	Central Valley and coastal valleys and foothills.	Forage in large groups in open grasslands, nesting in hollows on the ground, and are also regularly found breeding on the Valley floor in suitable habitat	Low potential to occur. Suitable habitat present on-site. There are no CNDDB record within 10 miles of the site. No active nesting observed. Highly mobile species could pass through and could establish nests in future years.
yellow-headed blackbird *Xanthocephalus xanthocephalus*	--/SSC/Yes	Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds.	Nests only where large insects such as odonatan are abundant, nesting timed with maximum emergence of aquatic insects.	Low potential to occur. Marginal habitat present on-site. There is one CNDDB record 0.5 miles east of the site. Nesting opportunities are absent. Highly mobile species could pass through.
Loggerhead shrike *Lanius ludovicianus*	BCC/SSC/ Yes	Resident and winter visitor in lowlands and foothills throughout California. Rare on coastal slope north of Mendocino County, occurring only in winter	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches	Low potential to occur. Marginal habitat present on-site. There is one CNDDB record 1.4 miles southeast of the site. Highly mobile species could pass through.
merlin *Falco columbarius*	--/WL/Yes	Does not nest in California. Rare but widespread winter visitor to the Central Valley and coastal areas	Forages along coastline in open grasslands, savannas, and woodlands. Often forages near lakes and other wetlands	No potential to occur. Habitat not present.
song sparrow ("Modesto" population) *Melospiza melodia*	BCC/SSC/ Yes	Restricted to California, where it is locally numerous in the Sacramento Valley, Sacramento–San Joaquin River Delta, and northern San Joaquin Valley. Exact boundaries of range uncertain.	Found in emergent freshwater marshes dominated by tules (*Scirpus* spp.) and cattails (*Typha* spp.) as well as riparian willow (*Salix* spp.) thickets. They also nest in riparian forests of Valley Oak (*Quercus lobata*) with a sufficient understory of blackberry (*Rubus* spp.), along vegetated irrigation canals and levees, and in recently planted Valley Oak restoration sites.	No potential to occur. Habitat not present.

SPECIES	*STATUS (FED/CA/ SJMSCP)*	*GEOGRAPHIC DISTRIBUTION*	*HABITAT REQUIREMENTS*	*PRESENCE DETERMINATION*
western yellow-billed cuckoo *Coccyzus americanus occidentalis*	T/E/Yes	Nests along the upper Sacramento, lower Feather, south fork of the Kern, Amargosa, Santa Ana, and Colorado Rivers	Wide, dense riparian forests with a thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging; may avoid valley oak riparian habitats where scrub jays are abundant	No potential to occur. Habitat not present.
least Bell's vireo *Vireo bellii pusillus*	E/E/No	Central Valley of California and other low-elevation river valleys.	Dense brush, mesquite, willow-cottonwood forest, streamside thickets, and scrub oak.	No potential to occur. Habitat not present. There is one CNDDB record 9.1 miles north of the site. Nesting opportunities are present. Highly mobile species could pass through.
FISH				
Delta smelt *Hypomesus transpacificus*	T/T/Yes	Primarily in the Sacramento–San Joaquin Estuary but has been found as far upstream as the mouth of the American River on the Sacramento River and Mossdale on the San Joaquin River; range extends downstream to San Pablo Bay.	Occurs in estuary habitat in the Delta where fresh and brackish water mix in the salinity range of 2–7 parts per thousand.	No potential to occur. Habitat not present.
green sturgeon - southern DPS *Acipenser medirostris pop. 1*	T/--/Yes	Spawns in the Sacramento, Feather and Yuba Rivers. Presence in upper Stanislaus and San Joaquin Rivers may indicate spawning.	Spawning site fidelity. Non-spawning adults occupy marine/estuarine waters. Delta Estuary is important for rearing juveniles. Spawning occurs primarily in cool (11-15 C) sections of mainstem rivers in deep pools (8-9 meters) with substrate containing small to medium sized sand, gravel, cobble, or boulder.	No potential to occur. Habitat not present.
hardhead *Mylopharodon conocephalus*	--/SSC/No	Tributary streams in the San Joaquin drainage; large tributary streams in the Sacramento River and the main stem.	Resides in low to mid-elevation streams and prefer clear, deep pools and runs with slow velocities. They also occur in reservoirs.	No potential to occur. Habitat not present.
steelhead - Central Valley DPS *Oncorhynchus mykiss irideus pop. 11*	T/--/No	This distinct population segment, or DPS, includes all naturally spawned populations of steelhead (and their progeny) in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco Bay and San Pablo Bays and their tributaries.	Free of heavy sedimentation with adequate flow and cool, clear water. Gravel that is between 0.5 to 6.0 inches in diameter, dominated by 2 to 3-inch gravel. Escape cover such as logs, undercut banks, and deep pools for spawning adults.	No potential to occur. Habitat not present.
Longfin smelt *Spirinchus thaleichthys*	--/SSC/Yes	Occurs in estuaries along the California coast. Adults concentrated in Suisun, San Pablo, and North San Francisco Bays.	Prior to spawning, these fish aggregate in deepwater habitats available in the northern Delta, including, primarily, the channel habitats of Suisun Bay and the Sacramento River.	No potential to occur. Habitat not present.

SPECIES	STATUS (FED/CA/ SJMSCP)	GEOGRAPHIC DISTRIBUTION	HABITAT REQUIREMENTS	PRESENCE DETERMINATION
			Spawning occurs in fresh water on the San Joaquin River below Medford Island and on the Sacramento River below Rio Vista.	
Mammals				
Pallid bat *Antrozous pallidus*	--/SSC/No	Occurs throughout California except the high Sierra from Shasta to Kern County and the northwest coast, primarily at lower and mid elevations	Occurs in a variety of habitats from desert to coniferous forest. Most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California. Relies heavily on trees for roosts	Low potential to occur. Roosting habitat present on-site. There are no CNDDB record within approximately 14 miles of the site. Highly mobile species could pass through or forage if roosting nearby.
riparian (=San Joaquin Valley) woodrat *Neotoma fuscipes riparia*	E/SSC/Yes	Nests along the upper Sacramento, lower Feather, south fork of the Kern, Amargosa, Santa Ana, and Colorado Rivers	Wide, dense riparian forests with a thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging; may avoid valley oak riparian habitats where scrub jays are abundant	No potential to occur. Habitat not present.
Townsend's big-eared bat *Corynorhinus townsendii*	--/SSC/Yes	Coastal regions from Del Norte County south to Santa Barbara County.	Roosts in caves, tunnels, mines, and dark attics of abandoned buildings. Very sensitive to disturbances and may abandon a roost after one onsite visit.	Low potential to occur. Roosting habitat present on-site. There are no CNDDB record within 15 miles of the site. Highly mobile species could pass through or forage if roosting nearby.
Western mastiff bat *Eumops perotis californicus*	--/SSC/Yes	Occurs along the western Sierra primarily at low to mid elevations and widely distributed throughout the southern coast ranges. Recent surveys have detected the species north to the Oregon border	Found in a wide variety of habitats from desert scrub to montane conifer. Roosts and breeds in deep, narrow rock crevices, but may also use crevices in trees, buildings, and tunnels	Low potential to occur. Roosting habitat present on-site. There are no CNDDB record within 14 miles of the site. Highly mobile species could pass through or forage if roosting nearby.
San Joaquin pocket mouse *Perognathus inornatus*	--/--/Yes	Occurs throughout the San Joaquin Valley and in the Salinas Valley	Favors grasslands and scrub habitats with fine textured soils	Low potential to occur. Agricultural land use likely precludes this species from maintaining long-term populations on the site. During fallow periods, the habitat improves for this species. One CNDDB record located approximately 7.8 miles west of the site.

SPECIES	*STATUS (FED/CA/ SJMSCP)*	*GEOGRAPHIC DISTRIBUTION*	*HABITAT REQUIREMENTS*	*PRESENCE DETERMINATION*
Riparian brush rabbit *Sylvilagus bachmani riparius*	E/E/Yes	Limited to San Joaquin County at Caswell State Park near the confluence of the Stanislaus and San Joaquin Rivers and Paradise Cut area on Union Pacific right-of-way lands	Native valley riparian habitats with large clumps of dense shrubs, low-growing vines, and some tall shrubs and trees	No potential to occur. Habitat not present.
American badger *Taxidea taxus*	--/SSC/Yes	In California, badgers occur throughout the state except in humid coastal forests of northwestern California in Del Norte and Humboldt Counties	Badgers occur in a wide variety of open, arid habitats but are most commonly associated with grasslands, savannas, mountain meadows, and open areas of desert scrub; the principal habitat requirements for the species appear to be sufficient food (burrowing rodents), friable soils, and relatively open, uncultivated ground	Low potential to occur. Suitable foraging habitat on-site; and highly mobile species. Agricultural land use likely precludes this species from maintaining burrows on the site. There is one CNDDB record 6.3 miles southwest of the site.
San Joaquin kit fox *Vulpes macrotis mutica*	E/T/Yes	Principally occurs in the San Joaquin Valley and adjacent open foothills to the west; recent records from 17 counties extending from Kern County north to Contra Costa County	Saltbush scrub, grassland, oak, savanna, and freshwater scrub	Low potential to occur. No dens present, but highly mobile species that could forage on the site. Agricultural land use likely precludes this species from maintaining dens on the site. No CNDDB occurrences within 11-miles of the site.
Reptiles				
California glossy snake *Arizona elegans occidentalis*	--/SSC/No	Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California.	Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils	Low potential to occur. The Project site could provide some upland habitat, including nesting opportunities during fallow periods, however, active agricultural activities in the immediate vicinity, as well as regular disking for weed abatement on-site, largely inhibit upland nesting for this species.
Western pond turtle Emys marmorata	--/SSC/Yes	Occurs from the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests	No potential to occur. Habitat not present.
San Joaquin coachwhip *Masticophis*	--/SSC/Yes	From Colusa County in the Sacramento Valley southward to the grapevine in the San Joaquin Valley and westward into the inner coast ranges.	Occurs in open, dry, vegetative associations with little or no tree cover. It occurs in valley grassland and saltbush scrub associations. Often	Low potential to occur. Marginal habitat present in the Project area. No CNDDB occurrences within 13-

Species	*Status (Fed/CA/ SJMSCP)*	*Geographic Distribution*	*Habitat Requirements*	*Presence Determination*
flagellum ruddocki		An isolated population occurs at Sutter Buttes. Known elevational range from 20 to 900 meters	occurs in association with mammal burrows.	miles of the site.
giant gartersnake *Thamnophis gigas*	T/T/Yes	Rivers, canals, irrigation ditches, rice fields, and other aquatic habitats with slow moving water and heavy emergent vegetation.	Endemic to the Central Valley. In the Sacramento Valley, suitable habitats occur primarily in the central portion of the valley floor.	No potential to occur. Habitat not present.
Coast horned lizard *Phrynosoma blainvillii*	--/SSC/No	Sacramento Valley, including foothills, south to southern California; Coast Ranges south of Sonoma County; below 4,000 feet in northern California	Grasslands, brushlands, woodlands, and open coniferous forest with sandy or loose soil; requires abundant ant colonies for foraging.	No potential to occur. Habitat not present.

Notes: The presence determinations were made by principal biologist, Steve McMurtry (De Novo Planning Group, 2022 and 2023) and are based on the site survey, review of on-site habitat conditions, and the CNDDB results.

Status explanations:

Federal

E = endangered under the federal Endangered Species Act.

T = threatened under the federal Endangered Species Act.

C = candidate species for listing under the federal Endangered Species Act.

D = delisted from federal listing status.

BCC = Bird of Conservation Concern

State

E = endangered under the California Endangered Species Act.

T = threatened under the California Endangered Species Act.

C = candidate species for listing under the State Endangered Species Act.

FP = fully protected under the California Fish and Game Code.

SSC = species of special concern in California.

3.4.2 REGULATORY SETTING

There are several regulatory agencies whose responsibility includes the oversight of the natural resources of the state and nation including the California Department of Fish and Wildlife (CDFW), USFWS, U.S. Army Corps of Engineers (USACE), and the Central Valley Regional Water Quality Control Board (CVRWQCB). These agencies often respond to declines in the quantity of a particular habitat or plant or animal species by developing protective measures for those species or habitat type. The following is an overview of the federal, state, and local regulations that are applicable to the proposed Project.

FEDERAL

Federal Endangered Species Act

The Federal Endangered Species Act (FESA), administered by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), provides protection to plant and wildlife species listed as endangered or threatened. In general, USFWS has jurisdiction over terrestrial and fresh-water species, while NMFS has jurisdiction over ocean-going species.

Section 9 of FESA generally prohibits all persons from causing the "take" of any member of a listed species. (16 U.S.C. § 1538.) This prohibition applies mainly to animals; it only extends to plants in areas "under federal jurisdiction" and plants already protected under state law. (Id., subd. (a)(2)(B); see also Northern Cal. River Watch v. Wilcox (9th Cir. 2010) 620 F.3d 1075.)

"Take" is defined in statute as, "... to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." (16 U.S.C. § 1532(19).) Harass is defined in regulation as "...an intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering." (See 50 CFR § 17.3.) Harm is defined in regulation as "...significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering." (Id.) Despite the general prohibition against take, FESA in some circumstances permits "incidental take," which means take that is incidental to, but not the purpose of, the carrying out of an otherwise lawful activity. (16 U.S.C. § 1539(a).) Under section 10 of FESA, persons seeking permission to engage in actions that could result in such incidental take can obtain such permission through the approval of a habitat conservation plan (HCP) by either USFWS or NMFS. (16 U.S.C., § 1539(a).)

Proposed federal actions that would result in take of a federal-listed or proposed species require consultation with USFWS or NMFS under section 7 of FESA. (Id., § 1536.) The objective of consultation is to determine whether the proposed federal action would jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat. Where such an outcome would not occur, USFWS or NMFS must still impose reasonable and prudent measures to minimize the effects of the incidental taking. Where such an outcome could occur, USFWS or

NMFS must propose reasonable and prudent alternatives that, if implemented, would avoid such an outcome. (Id.)

Compliance with ESA can be achieved under Section 7 or 10 of FESA depending on the involvement of the federal government. Section 7 requires federal agencies to make a finding on all federal actions, including the approval by an agency of a public or private action, such as the issuance of a "404 permit" for filling wetlands by the U.S. Army Corps of Engineers (USACE), on the potential of the action to jeopardize the continued existence of any listed species impacted by the action or to result in the destruction or adverse modification of such species' critical habitat. Provisions of Section 10 are implemented when there is no federal involvement in a project except compliance with FESA. A take not specifically allowed by federal permit under Section 7 or Section 10(a)(1)(B) of the FESA is subject to enforcement through civil or criminal proceedings under Section II of the FESA.

Migratory Bird Treaty Act

To kill, possess, or trade a migratory bird, bird part, nest, or egg is a violation of the Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., §703, Supp. I, 1989), unless it is in accordance with the regulations that have been set forth by the Secretary of the Interior.

Federal Bald and Golden Eagle Protection Act

The Federal Bald and Golden Eagle Protection Act provide regulations to protect bald and golden eagles as well as their nests and eggs from willful damage or injury.

Clean Water Act – Section 404

Section 404 of the CWA regulates all discharges of dredged or fill material into waters of the U.S. Discharges of fill material includes the placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §328.2(f)]. Waters of the U.S. include lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows. Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" [33 C.F.R. §328.3(b)]. Waters of the U.S. exhibit a defined bed and bank and ordinary high-water mark (OHWM). The OHWM is defined by the USACE as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" [33 C.F.R. §328.3(e)].

In general, Section 404 of the Clean Water Act requires permits for the discharge of dredged or fill material into waters of the United States, including wetlands. However, certain activities are exempt from permit requirements under Section 404(f)(1). Activities that are exempt under the Clean Water Act, Section 404(f)(1), include:

- Established (ongoing) farming, ranching, and silviculture activities such as plowing, seeding, cultivating, minor drainage, harvesting to produce food, fiber, and forest products, or upland soil and water conservation practices
- Maintenance (but not construction) of drainage ditches
- Construction and maintenance of irrigation ditches
- Construction and maintenance of farm or stock ponds
- Construction and maintenance of farm and forest roads, in accordance with best management practices
- Maintenance of structures such as dams, dikes, and levees

Clean Water Act – Section 401

Section 401 of the CWA (33 U.S.C. 1341) requires an applicant who is seeking a 404 permit to first obtain a water quality certification from the RWQCB. To obtain the water quality certification, the CVRWQCB must indicate that the proposed fill would be consistent with the standards set forth by the state.

Rivers and Harbors Act of 1899

The Rivers and Harbors Act prohibits the obstruction or alteration of any navigable water of the United States. The Act requires authorization from the USACE for any excavation or deposition of materials into these waters or for any work that could affect the course, location, condition, or capacity of rivers or harbors.

STATE

Fish and Game Code §2050-2097 - California Endangered Species Act

The California Department of Fish and Wildlife (CDFW) administers several laws and programs designed to protect fish and wildlife resources. Principal of these is the California Endangered Species Act of 1984 (CESA Fish and Game Code Section 2050 et seq.), which regulates the listing and take of state endangered and threatened species, as well as candidate species. Under Section 2081 of CESA, CDFW may authorize take of an endangered and/or threatened species, or candidate species, by an incidental take permit or Memorandum of Understanding (MOU) for scientific, educational, or management purposes. In approving an incidental take permit, CDFW must ensure, among other things, that "[t]he impacts of the authorized take shall be minimized and fully mitigated." Further, "[t]he measures required to meet this obligation shall be roughly proportional in extent to the impact of the authorized taking on the species. Where various measures are available to meet this obligation, the measures required shall maintain the applicant's objectives to the greatest extent possible. All required measures shall be capable of successful implementation." To be consistent with Federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants, as previously designated under the California Native Plant Protection Act (discussed below). Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Under State law, plant and animal species may be formally designated by official listing by the California Fish and Game Commission.

Fish and Game Code §2800-2835 – Natural Communities Conservation Planning Act

The Natural Communities Conservation Planning Act is set forth in Fish and Game Code Sections 2800–2835. The intent of the legislation is to provide for conservation planning as an officially recognized policy that can be used as a tool to eliminate conflicts between the protection of natural resources and the need for growth and development. In addition, the legislation promotes conservation planning as a means of coordination and cooperation among private interests, agencies, and landowners, and as a mechanism for multispecies and multi-habitat management and conservation. The development of Natural Community Conservation Plans (NCCPs) is an alternative to obtaining take authorization under Section 2081 of the Fish and Game Code.

Fish and Game Code §1900-1913 – California Native Plant Protection Act

In 1977 the State Legislature passed the Native Plant Protection Act (NPPA) in recognition of rare and endangered plants of the state. The intent of the law was to preserve, protect, and enhance endangered plants. The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants. The NPPA includes provisions that prohibit the taking of plants designated as "rare" from the wild, and a salvage mandate for landowners, which requires notification of the CDFW 10 days in advance of approving a building site.

Fish and Game Code §3503, 3503.5, 3800 – Predatory Birds

Under California Fish and Game Code section 3503, "[i]t is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Under section 3503.5, "[i]t is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird, except as otherwise provided by this code or any regulation adopted pursuant thereto." Section 3503 allows some destruction of nests or eggs (it cannot be done "needlessly"), while section 3503.5 prohibits such destruction outright. Under section 3800, it is generally unlawful to take "any nongame bird," with some exceptions. Any activity that would cause a nest to be abandoned or cause a reduction or loss in a reproductive effort is commonly understood to constitute a take. This generally includes construction activities.

Fish and Game Code §1601-1603 – Streambed Alteration

Under the California Fish and Game Code, CDFW has jurisdiction over any proposed activities that would divert or obstruct the natural flow or change the bed, channel, or bank of any lake or stream. Private landowners or project proponents must obtain a "Streambed Alteration Agreement" from CDFW prior to any alteration of a lake bed, stream channel, or their banks. Through this agreement, the CDFW may impose reasonable measures necessary to protect fish and wildlife resources.

Fish and Game Code §3511, 3513, 4700, and 5050 – Fully Protected Species

Fish and Game Code Sections 3511, 3513, 4700, and 5050 pertain to fully protected wildlife species (birds in Sections 3511 and 3513, mammals in Section 4700, and reptiles and amphibians in Section 5050) and strictly prohibit the take of these species. CDFW cannot issue a take permit for fully protected species, except under narrow conditions for scientific research or the protection of livestock, or if an NCCP has been adopted.

California Environmental Quality Act Guidelines § 15380 – Unlisted Species Worth of Protection

The CEQA Guidelines provide that a species that is not listed on the federal or state endangered species list may nevertheless be considered rare or endangered if the species meets certain criteria. (CEQA Guidelines § 15380) Species that are not listed under FESA or CESA, but are otherwise eligible for listing (i.e. candidate, or proposed) may be protected by the local government until the opportunity to list the species arises for the responsible agency.

Species that may be considered for review are included on a list of “Species of Special Concern,” developed by the CDFW. Additionally, the California Native Plant Society (CNPS), a nongovernmental organization, maintains a list of plant species native to California that have low populations, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. List 1A contains plants that are believed to be extinct. List 1B contains plants that are rare, threatened, or endangered in California and elsewhere. List 2 contains plants that are rare, threatened, or endangered in California, but more numerous elsewhere.

California Wetlands Conservation Policy

In August 1993, the Governor announced the "California Wetlands Conservation Policy.” The goals of the policy are to establish a framework and strategy that will:

- Ensure no overall net loss and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.
- Reduce procedural complexity in the administration of State and federal wetland conservation programs.
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetland conservation and restoration.

The Governor also signed Executive Order W-59-93, which incorporates the goals and objectives contained in the new policy and directs the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.) is California's primary water quality control statute. But its protections extend to wetlands, and in some instances wetlands that are not subject to federal jurisdiction under the Clean Water Act. Under the Porter-Cologne Act definition, waters of the state are "any surface water or groundwater, including saline waters, within the boundaries of the state." (Wat. Code, § 13050[e].) Although all waters of the United States that are within the borders of California are also waters of the state, the reverse is not necessarily true. Therefore, California retains authority to regulate discharges of waste into any waters of the state, discharges to receiving waters more broadly than the CWA does.

Waters of the state fall under the jurisdiction of the nine Regional Water Quality Control Boards (RWQCBs). Under Porter-Cologne, each RWQCB must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control nonpoint and point sources of pollution. California Water Code Section 13260 requires any person discharging waste, or proposing to discharge waste, in any region that could affect the waters of the state to file a report of discharge (an application for waste discharge requirements [WDRs]) with the applicable RWQCB. Construction activities that may discharge wastes into the waters of the state must meet the discharge control requirements of the Porter-Cologne Act.

On April 2, 2019, the State Water Resources Control Board (State Water Board) adopted Resolution 2019-0015, thereby adopting a document entitled, "State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State" ("Procedures") for inclusion in the Water Quality Control Plans for Inland Surface Waters, Enclosed Bays, and Estuaries of California.[1]

In taking this action, the State Water Board noted that under the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) (Wat. Code, Div. 7, § 13000 et seq.), discharges of dredged or fill material to waters of the state are subject to waste discharge requirements or waivers thereof. The State Water Board further explained that "although the state has historically relied primarily on requirements in the Clean Water Act to protect wetlands, U.S. Supreme Court rulings reducing the jurisdiction of the Clean Water Act over wetland areas by limiting the definition of 'waters of the United States' have necessitated the use of California's independent authorities under the Porter-Cologne Act to protect these vital resources."

The Office of Administrative Law (OAL) approved the Procedures on August 28, 2019. Pursuant to the Procedures, the effective date is nine months upon OAL approval. Accordingly, the Procedures will be effective May 28, 2020.

---

[1] See: https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/procedures_conformed.pdf

By adopting the Procedures, the State Water Board mandated and standardized the evaluation of impacts and protection of waters of the state from impacts due to dredge and fill activities. The Procedures include: 1) a wetland definition; 2) a jurisdictional framework for determining if a feature that meets the wetland definition is a water of the state; 3) wetland delineation procedures; and 4) procedures for application submittal, and the review and approval of dredge or fill activities.

The Procedures define an area as a wetland if it meets three criteria: wetland hydrology, wetland soils, and (if vegetated) wetland plants. An area is a wetland if: (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

Waters of the State, by definition, includes more aquatic features than Waters of the U.S., which defines the jurisdiction of the federal government. Waters of the State are not so limited. In addition, the federal definition of a wetland requires a prevalence of wetland vegetation under normal circumstances. To account for wetlands in arid portions of the state, the State Water Board's definition differs from the federal definition in that an area may be a wetland even if it does not support vegetation. If vegetation is present, however, the State Water Board's definition requires that the vegetation be wetland vegetation. The State Water Board's definition clarifies that vegetated and unvegetated wetlands will be regulated in the same manner.

The Procedures also include a jurisdictional framework that applies to aquatic features that meet the wetland definition. The jurisdictional framework will guide applicants and staff in determining whether an aquatic feature that meets the wetland definition will be regulated as a water of the state. The jurisdictional framework is intended to exclude from regulation any artificially-created, temporary features, such as tire ruts or other transient depressions caused by human activity, while still capturing small, naturally-occurring features, such as seasonal wetlands and small vernal pools that may be outside of federal jurisdiction. The Procedures do not expand the State Water Board's jurisdiction beyond areas already under State Water Board's jurisdiction.

The Procedures exclude the following agricultural features from the protections accorded to wetlands: (1) ditches with ephemeral flow that are not a relocated water of the state or excavated in a water of the state; (2) ditches with intermittent flow that are not a relocated water of the state or excavated in a water of the state, or that do not drain wetlands other than any wetlands described in (4) or (5) below; (3) ditches that do not flow, either directly or through another water, into another water of the state; (4) artificially irrigated areas that would revert to dry land should application of waters to that area cease; or (5) artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, and settling basins.

The Procedures clarify what information and analysis the applicant needs to submit to have a complete application. The Procedures standardize when an alternative analysis needs to be conducted and set a minimum mitigation ratio for any permanent impacts to waters of the state resulting from dredge and fill activities.

When an alternatives analysis is required, the applicant must demonstrate that the proposed alternative is the Least Environmentally Damaging Practicable Alternative (LEDPA). The term practicable means available and capable of being done after taking into consideration cost, existing technology, and other logistics considering the overall project purpose.

Water Quality Control Plan for the Sacramento-San Joaquin River Basins

The Water Quality Control Plan for the Sacramento-San Joaquin River Basins (Basin Plan), most recently revised in May 2018 by the CVRWQCB in 1998, identifies the beneficial uses of water bodies and provides water quality objectives and standards for waters of the Sacramento River and San Joaquin River Basins, including the Delta.

State and federal laws mandate the protection of designated “beneficial uses” of water bodies. State law defines beneficial uses as “domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves” (Water Code Section 13050[f]). Additional protected beneficial uses of the San Joaquin River include groundwater recharge and fresh water replenishment.

CDFW Staff Report on Burrowing Owl Mitigation

The CDFW has designated certain species as “species of special concern” when their population viability and survival is adversely affected by risk factors such as precipitous declines or other vulnerability factors (Shuford and Gardali 2008). Preliminary analyses of regional patterns for breeding populations of burrowing owls (*Athene cunicularia*) have detected declines both locally in their central and southern coastal breeding areas, and statewide where the species has experienced modest breeding range retraction (Gervais et al. 2008). In California, threat factors affecting burrowing owl populations include habitat loss, degradation and modification, and eradication of ground squirrels resulting in a loss of suitable burrows required by burrowing owls for nesting, protection from predators, and shelter.

The CDFW recognized the need for a comprehensive conservation and mitigation strategy for burrowing owls, and in 1995 directed staff to prepare a report describing mitigation and survey recommendations. This report, “1995 Staff Report on Burrowing Owl Mitigation” (Staff Report) (CDFG 1995), contained CDFW-recommended burrowing owl and burrow survey techniques and mitigation measures intended to offset the loss of habitat and slow or reverse further decline of this species. Notwithstanding these measures, over the subsequent 15+ years, burrowing owls continued to decline in portions of their range (DeSante et al. 2007, Wilkerson and Siegel, 2010). The CDFW therefore determined that reversing declining population and range trends for burrowing owls required implementation of more effective conservation actions, and evaluate the efficacy of the CDFW’s pre-existing recommended avoidance, minimization, and mitigation approaches for burrowing owls. As such, the CDFW updated the 1995 Staff Report in 2012.

The CDFW has identified three main actions that together will facilitate a more viable, coordinated, and concerted approach to conservation and mitigation for burrowing owls in California. These include:

1. Incorporating burrowing owl comprehensive conservation strategies into landscape-based planning efforts such as Natural Community Conservation Plans (NCCPs) and multi-species Habitat Conservation Plans (HCPs) that specifically address burrowing owls.
2. Developing and implementing a statewide conservation strategy (Burkett and Johnson, 2007) and local or regional conservation strategies for burrowing owls, including the development and implementation of a statewide burrowing owl survey and monitoring plan.
3. Developing more rigorous burrowing owl survey methods; working to improve the adequacy of impacts assessments; developing clear and effective avoidance and minimization measures; and developing mitigation measures to ensure impacts to the species are effectively addressed at the project, local, and/or regional level (the focus of this document).

The Staff Report on Burrowing Owl Mitigation (2012) sets forth the CDFW's recommendations for implementing the third approach identified above by revising the 1995 Staff Report, drawing from the most relevant and current knowledge and expertise, and incorporating the best scientific information. General strategies for mitigation include the following: designing projects to avoid negative impacts and disturbances that could result in take of burrowing owls, nests, or eggs; conducting take avoidance (pre-construction) surveys to detect the presence of burrowing owls on a project site at a fixed period in time in order to inform necessary take avoidance actions; engaging in site surveillance to ascertain whether burrowing owls may be attempting to colonize or re-colonize an area that will be impacted; minimizing impacts through the use of buffer zones, visual screens, or other measures while project activities are occurring; undertaking minimization measures such as eliminating actions that reduce burrowing owl forage and burrowing surrogates (e.g. ground squirrels); using burrow exclusion measures such as installing one-way doors in burrow openings during the non-breeding season to temporarily exclude burrowing owls, or permanently excluding burrowing owls and closing burrows after verifying the burrows are empty; restoration of temporarily disturbed habitat to pre-project conditions; replacing or otherwise compensating for permanently impacted habitat; and creating artificial burrows to replace natural burrows.

LOCAL

City of Lathrop General Plan

POLICIES: RECREATION AND RESOURCES ELEMENT

- RR-4.1: Sensitive Communities. Protect, conserve, and enhance Lathrop's biological resources, with a special focus on sensitive, rare, or endangered plant and wildlife species in accordance with state and federal resource agency requirements.
- RR-4.2: Habitat Conservation. Support habitat conservation efforts to set aside and preserve suitable habitats, with priority given to habitats for rare and endangered species in accordance with state and federal resource agency requirements.

- RR-4.3: Native Species. Conserve existing native trees and vegetation where possible and encourage the use of native species in development and infrastructure projects.
- RR-4.4: Natural Water Bodies and Drainage Systems. Limit the disturbance of natural water bodies and drainage systems in Lathrop by conserving natural open space areas, protecting channels, and minimizing the impacts from stormwater and urban runoff.
- RR-4.6: Urban Forest. To the extent feasible, build upon existing streetscapes and develop an urban forest along the City's major corridors and in residential neighborhoods to provide avian habitat, sequester carbon emissions, foster pedestrian activity, and provide shade.
- RR-4.11: Development. Require that all new development identify potential impacts to existing biological resources and provide mitigation measures as necessary pursuant to CEQA in order to protect these resources from negative externalities.

ACTIONS: RECREATION AND RESOURCES ELEMENT

- RR-4a: Cooperate with state, federal, and local agencies to ensure that development does not cause significant adverse impacts to existing riparian corridors.
- RR-4b: Require new development, infrastructure, long-range planning, and similar projects, to comply with the requirements of the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan to ensure that potentially significant impacts to special-status species and sensitive resources are adequately addressed.
- RR-4c: Require new development which has the potential to result in water quality impacts to the City's waterways and the local groundwater basin to implement all feasible mitigation measures to reduce impacts.
- RR-4e: Where sensitive biological habitats have been identified on or immediately adjacent to a project site, the project shall include appropriate mitigation measures identified by SJMSCP, which may include, but are not limited to the following:
    A. Pre-construction surveys for species listed under the State or Federal Endangered Species Acts, or species identified as special-status by the resource agencies, shall be conducted by a qualified biologist;
    B. Construction barrier fencing shall be installed around sensitive resources and areas identified for avoidance or protection, and to reduce potential soil compaction in sensitive areas; and
    C. Pre-Construction training of contractors and sub-contractors shall be conducted by a qualified biologist to identify and avoid protected species and habitat.
- RR-7d: Review and regulate new development, infrastructure, and levee improvement projects to ensure consistency with Federal and State flood and floodway requirements, including BDCP and Delta Plan policies as applicable.

San Joaquin County Multi-Species Habitat Conservation and Open Space Plan

A Habitat Conservation Plan (HCP) is a federal planning document that is prepared pursuant to Section 10 of the FESA. An approved HCP within a defined plan area allows for the incidental take of species and habitat that are otherwise protected under FESA during development activities.

A Natural Community Conservation Plan (NCCP) is a state planning document administered by CDFW. An approved NCCP within a defined plan area allows for the incidental take of species and habitat that are otherwise protected under CESA during growth and development activities.

BACKGROUND

The key purpose of the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP), is to provide a strategy for balancing the need to conserve Open Space and the need to Convert Open Space to non-Open Space uses while protecting the region's agricultural economy; preserving landowner property rights; providing for the long-term management of plant, fish and wildlife species, especially those that are currently listed, or may be listed in the future, under the Federal Endangered Species Act (ESA) or the CESA; providing and maintaining multiple-use Open Spaces which contribute to the quality of life of the residents of San Joaquin County; and accommodating a growing population while minimizing costs to Project Proponents and society at large.

San Joaquin County's past and future (2001-2051) growth has affected and will continue to affect 97 special status plant, fish and wildlife species in 52 vegetative communities scattered throughout San Joaquin County's 1,400+ square miles and 900,000+ acres, which include 43 percent of the Sacramento-San Joaquin Delta's Primary Zone. The SJMSCP, in accordance with ESA Section 10(a)(1)(B) and CESA Section 2081(b) Incidental Take Permits, provides compensation for the Conversion of Open Space to non-Open Space uses which affect the plant, fish and wildlife species covered by the Plan, hereinafter referred to as "SJMSCP Covered Species". In addition, the SJMSCP provides some compensation to offset the impacts of open space land conversions on non-wildlife related resources such as recreation, agriculture, scenic values and other beneficial Open Space uses.

The SJMSCP compensates for Conversions of Open Space for the following activities: urban development, mining, expansion of existing urban boundaries, non-agricultural activities occurring outside of urban boundaries, levee maintenance undertaken by the San Joaquin Area Flood Control Agency, transportation projects, school expansions, non-federal flood control projects, new parks and trails, maintenance of existing facilities for non-federal irrigation district projects, utility installation, maintenance activities, managing Preserves, and similar public agency projects. These activities will be undertaken by both public and private individuals and agencies throughout San Joaquin County and within the County's incorporated cities of Escalon, Manteca, Lathrop, Lodi, Manteca, Ripon, Stockton and Tracy. Public agencies including Caltrans (for transportation projects), and the San Joaquin Council of Governments (for transportation projects) also will undertake activities which will be covered by the SJMSCP. In addition, 5,340 acres is allocated for anticipated projects (e.g., annexations, general plan amendments)

The 97 SJMSCP Covered Species include 25 state and/or federally listed species. The SJMSCP Covered Species include 27 plants (6 listed), 4 fish (2 listed), 4 amphibians (1 listed), 4 reptiles (1 listed), 33 birds (7 listed), 15 mammals (3 listed) and 10 invertebrates (5 listed).

IMPLEMENTATION

The SJMSCP is administered by a Joint Powers Authority consisting of members of the San Joaquin County Council of Governments (SJCOG), the CDFW, and the USFWS. Development project applicants are given the option of participating in the SJMSCP as a way to streamline compliance with required local, State and federal laws regarding biological resources, and typically avoid having to approach each agency independently. According to the SJMSCP, adoption and implementation by local planning jurisdictions provides full compensation and mitigation for impacts to plants, fish and wildlife. Adoption and implementation of the SJMSCP also secures compliance pursuant to the state and federal laws such as CEQA, the National Environmental Policy Act (NEPA), the Planning and Zoning Law, the State Subdivision Map Act, the Porter-Cologne Act and the Cortese-Knox Act in regard to species covered under the SJMSCP.

Applicants pay mitigation fees on a per-acre basis, as established by the Joint Powers Authority according to the measures needed to mitigate impacts to the various habitat and biological resources. Different types of land require different levels of mitigation; i.e., one category requires that one acre of a similar land type be preserved for each acre developed, while another type requires that two acres be preserved for each acre developed. The entire County is mapped according to these categories so that landowners, project proponents and project reviewers are easily aware of the applicable SJMSCP fees for the proposed development.

The appropriate fees are collected by the City and remitted to SJCOG for administration. SJCOG uses the funds to preserve open space land of comparable types throughout the County, often coordinating with other private or public land trusts to purchase conservation easements or buy land outright for preservation. Development occurring on land that has been classified under the SJMSCP as “no-pay” would not be required to pay a fee. This category usually refers to already urbanized land and infill development areas. Although the fees are automatically adjusted on an annual basis, based on the construction cost index, they often cannot keep pace with the rapidly rising land prices in the Central Valley.

Multi-Agency Post Construction Stormwater Standards Manual

The City of Lathrop, in collaboration with San Joaquin County, Tracy, Lodi, Manteca, and Patterson prepared the Multi-Agency Post Construction Stormwater Standards Manual to provide consistent guidance to assist developers in meeting State and local mandates for storm water drainage. All new construction projects in the City of Lathrop are classified in the Multi-Agency Post Construction Stormwater Standards Manual based on their intended use (i.e., residential, parking areas, etc.). The following design standards must be implemented for all project classifications:

- Mitigate peak run-off flow rates
- Conserve and create natural areas
- Minimize storm water pollutants of concern
- Protect slopes and channels
- Provide storm drain stenciling and signage
- Properly design outdoor material and trash storage areas
- Provide proof of ongoing BMPs and maintenance

- Incorporate treatment control BMPs for water quality

City of Lathrop Municipal Code

The Lathrop Municipal Code provides rules and regulations to protect water courses (Chapter 12.28) and to manage and control stormwater and discharge (Chapter 13.28). Section 13.28.130 specifically provides requirement to prevent, control and reduce stormwater pollutants. This includes requirements to implement best management practices to the extent they are technologically achievable to prevent and reduce pollutants.

Additionally, Chapter 12.16 outlines requirements related to trees, including planting and removing trees. The Chapter is adopted to preserve, protect and promote the public health, safety, peace, comfort, convenience, prosperity and general welfare. More specifically, the Chapter is intended to achieve the following:

A. To provide a comprehensive plan for the planting, replanting, removal and maintenance of trees within designated public streets, including arterial and collector streets and streets providing access to public facilities;
B. To establish and maintain a pattern of street trees within all public streets which will enhance the living and working area of the city, enhance real property values, conserve energy, reduce glare, diminish the effects of vehicular noise, and avoid hazards to street improvements and to public safety occasioned by trees which are of such physical location or condition as to constitute a public nuisance. (Ord. 92-89)

3.4.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

CEQA Guidelines Appendix G is a sample Initial Study checklist that includes number of factual inquiries related to the subject of biological resources, as it does on a whole series of additional environmental topics. Notably, lead agencies are under no obligation to use these inquiries in fashioning thresholds of significance on the subject of air quality impacts, or indeed on any subject addressed in the checklist. (*Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th 1059, 1068.) Rather, with few exceptions, "CEQA grants agencies discretion to develop their own thresholds of significance." (*Ibid*.) Even so, it is a common practice for lead agencies to take the language from the inquiries set forth in Appendix G and to use that language in fashioning thresholds. The City has done so here, though it has exercised its discretion to modify the language of the Appendix G threshold addressing impacts to wetlands so that it applies not only to federally-protected wetlands, but also to wetlands that are protected under State law (the reach of which is sometimes broader than federal law).

Although CEQA generally gives agencies considerable discretion in fashioning significance thresholds, there are some thresholds that must, as a matter of law, be used by public agencies. Many of these relate to biological resources, and are found in CEQA Guidelines section 15065 ("Mandatory Findings of Significance").

Finally, the City is aware that neither Appendix G nor section 15065 sets forth language directly addressing potential effects on birds of prey or nesting birds due to violation of laws (described earlier) intended to protect them. The City has therefore exercised its discretion to formulate a threshold to address this category of impact.

Considering the foregoing, for purposes of this EIR, a significant impact would occur if implementation of the Specific Plan would:

- Substantially reduce the habitat of a fish or wildlife species;
- Cause a fish or wildlife population to drop below self-sustaining levels;
- Threaten to eliminate a plant or animal community;
- Substantially reduce the number or restrict the range of an endangered, rare, or threatened species;
- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on federally - or state- protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan;
- Result in the take or destruction of any nesting birds or birds of prey or the nest or eggs of such birds.

IMPACTS AND MITIGATION

Impact 3.4-1: Implementation of the proposed Project, with mitigation, would not have substantial direct or indirect effects on special-status invertebrate species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of an animal community, or a drop in population levels below self-sustaining levels. (Less than Significant with Mitigation)

According to the CNDDB, there are 11 special-status invertebrates that are documented within the nine-quadrangle Project region, including: California linderiella (*Linderiella occidentalis*), crotch bumble bee (*Bombus crotchii*), conservancy fairy shrimp (*Branchinecta conservation*), molestan blister beetle (*Lytta molesta*), Sacramento anthicid beetle (*Anthicus sacramento*), San Joaquin Valley giant flower-loving fly (*Rhaphiomidas trochilus*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), western ridged mussel (Gonidea angulate), and western bumble bee (*Bombus occidentalis*). As noted in Table 3.4-4, five of these are covered species under the SJMSCP.

The potential to have a substantial direct or indirect effect on special-status invertebrate species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of an invertebrate community, or a drop in population levels below self-sustaining levels, is discussed below.

VERNAL POOL INVERTEBRATES

California linderiella (*Linderiella occidentalis*) exclusively inhabit vernal pools or other seasonally ponded wetlands that sustain inundation during the winter before drying in the late spring. Western ridged mussel (*Gonidea angulate*) occurs primarily in creeks and rivers and less often lakes and was originally in most of state but is now extirpated from Central and Southern California. The Project site does not provide suitable habitat for these species.

Vernal pool fairy shrimp (VPFS) is a federal threatened invertebrate found in the Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. They are commonly found in vernal pools and in sandstone rock outcrop pools. VPFS is not anticipated to be directly affected by any individual phase or component of the proposed Project because there is not appropriate vernal pool habitat in the Project site.

Vernal pool tadpole shrimp (VPTS) is a federal endangered invertebrate found in vernal pools and stock ponds from Shasta County south to Merced County. VPTS is not anticipated to be directly affected by any individual phase or component of the proposed Project because there is not appropriate vernal pool habitat in the Project site.

BEES AND FLIES

Crotch bumble bee (*Bombus crotchii*), western bumble bee (*Bombus occidentalis*), and San Joaquin Valley giant flower-loving fly (*Rhaphiomidas trochilus*) may occur in the region, and in the Project area at times. Crotch bumble bee and San Joaquin Valley giant flower-loving fly are tracked by CDFW, but are not specifically protected under state or federal law. Western bumble bee is a federally threatened species.

The crotch bumble bee occurs primarily in California, including the Mediterranean region, Pacific Coast, Western Desert, Great Valley, and adjacent foothills through most of southwestern California. It also occurs in Mexico (Baja California and Baja California Sur) and has been documented in southwest Nevada, near the California border. Their natural habitat is grassland and scrub areas, requiring a hotter and drier environment than other bumblebee species. This species can only tolerate a very narrow range of climatic conditions. This is a non-migratory species of bumble bee that nests underground, often in abandoned rodent dens.

The western bumble bee was once one of the most common bee species in the North West America. They have been found from the Mediterranean California all the way up to the Tundra regions of Alaska, making them one of the bees with the widest range geographic range. In the past decade, the population of has dropped over 40% and has been especially significant in the Pacific states from California to Washington. Declines have been attributed to a parasite, as well as an increase in the honeybees. Their natural habitat is shrubland, grassland, and artificial/terrestrial areas. They have been observed on a wide variety of plans in open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows. This species is considered to be a more effective pollinator than honeybees and they have been commercially reared to pollinate crops such as alfalfa, avocados, apples, cherries, blackberries, cranberries, and blueberries.

Although not "natural habitat", the existing agricultural fields provide habitat for these bumble bee species. It is noted, however, that habitat for bumble bee species would be provided after development on-site within landscaped areas, with the crotch bumble bee most likely to utilize these areas.

The San Joaquin Valley giant flower-loving fly are historically known from, and endemic to, sandy soils of the San Joaquin Valley from Antioch Dunes in Contra Costa County south to Sand Ridge in Kern County. This species is associated with sandy soils such as riverine deposits and sand dunes with relatively sparse vegetation. Adults do not visit flowers/nectar. Females deposit eggs in and on the surface of sandy soil. Larvae burrow in fine sands up to 10 feet deep and are known to live for three years prior to pupation. The Project site does not provide appropriate habitat for this species.

BEETLES

Essential habitat for Molestan blister beetle and Sacramento anthicid beetle is not present in the Project area. The proposed Project is not expected to have a significant impact on these species.

Valley elderberry longhorn beetle (VELB) is a federal threatened insect, proposed for delisting. Elderberry (*Sambucus* sp.), which is a primary host species for valley elderberry longhorn beetle (VELB) is a common plant found throughout the region, but especially in riparian zones. One occurrence of this species exists over four miles from the site. There are no elderberry plants located within the agricultural fields, or otherwise in areas that would be developed. Potential habitat is limited to non-existent within the Project area. VELB is not anticipated to be directly affected by any individual phase or component of the proposed Project because there is not appropriate habitat in the Project site. The potential for this species to occur on-site is low.

CONCLUSION

Habitat for California California linderiella (*Linderiella occidentalis*), conservancy fairy shrimp (*Branchinecta conservation*), molestan blister beetle (*Lytta molesta*), Sacramento anthicid beetle (*Anthicus sacramento*), San Joaquin Valley giant flower-loving fly (*Rhaphiomidas trochilus*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), western ridged mussel (Gonidea angulate), and western bumble bee (*Bombus occidentalis*) is not found on-site.

Potential habitat for crotch bumble bee (*Bombus crotchii*) is found on-site. This species is not covered under the SJMSCP. Additionally, potential habitat for valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is found on-site. This species is covered under the SJMSCP. This impact is ***potentially significant***.

MITIGATION MEASURE(S)

Mitigation Measure 3.4-1: *The Project applicant shall implement the following measure to avoid or minimize impacts on special-status bumble bees:*

- *A qualified biologist(s) shall conduct a preconstruction survey with 7 days of the commencement of work. If special-status bees of any species are observed, they shall be photographed for identification. If construction begins between March 1 and November 1, the ground shall also be searched during the survey for active bumble bee colonies. If bee colonies are identified, these colonies shall be demarcated with a flagged avoidance buffer, as determined by a qualified biologist, and shall be avoided during the active season from March 1 through November 1, or until the qualified biologist has determined that the colony is no longer active or until the colony is relocated.*

Mitigation Measure 3.4-2*: Prior to commencement of any grading activities, the Project proponent shall obtain coverage under the SJMSCP to mitigate for habitat impacts to covered special-status species. Coverage involves compensation for habitat impacts on covered species through implementation of incidental take and minimization measures (ITMMs) and payment of fees for conversion of lands that may provide habitat for covered special-status species. These fees are used to preserve and/or create habitat in preserves to be managed in perpetuity. Obtaining coverage for a Project includes incidental take authorization (permits) under the Endangered Species Act Section 10(a), California Fish and Game Code Section 2081, and the MBTA. Coverage under the SJMSCP would fully mitigate all habitat impacts on covered special-status species.*

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Mitigation Measure 3.4-1 requires a preconstruction survey for special-status bumble bees and avoidance and mitigation measures should bumble bees be found. Additionally, Mitigation Measure 3.4-2 requires the Project proponent to obtain coverage under the SJMSCP to mitigate for habitat impacts to covered special-status species, including valley elderberry longhorn beetle. Coverage involves compensation for habitat impacts on covered species through implementation of incidental take and minimization measures (ITMMs) and payment of fees for conversion of lands that may provide habitat for covered special-status species. These fees are used to preserve and/or create habitat in preserves to be managed in perpetuity.

With implementation of these mitigation measures, the proposed Project would have a ***less than significant*** impact on special-status invertebrate species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of an invertebrate community, or a drop in population levels below self-sustaining levels.

Impact 3.4-2: Implementation of the proposed Project, with mitigation, would not have substantial direct or indirect effects on special-status reptile and amphibian species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a reptile or amphibian community, or a drop in population levels below self-sustaining levels. (Less than Significant with Mitigation)

According to the CNDDB, there are nine special-status amphibian and reptile species that are documented within the nine-quadrangle Project region, the: California glossy snake (*Arizona* elegans occidentalis), western pond turtle (*Emys marmorata*), San Joaquin coachwhip (*Masticophis flagellum ruddocki*), giant gartersnake (*Thamnophis gigas*), coast horned lizard (*Phrynosoma blainvillii*), California tiger salamander (*Ambystoma californiense* [*A. tigrinum c.*]), foothill yellow-legged frog (*Rana boylii*), California red-legged frog (*Rana aurora draytoni*), and western spadefoot (*Spea hammondii*). As noted in Table 3.4-4, all the amphibians are covered species under the SJMSCP. Three of the five reptiles are covered species under the SJMSCP.

The potential to have a direct or indirect substantial effect on special-status reptile and amphibian species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a reptile or amphibian community, or a drop in population levels below self-sustaining levels, is discussed below.

CALIFORNIA GLOSSY SNAKE

The California glossy snake is a California Species of Special Concern and is most common in desert habitats but also occur in chaparral, sagebrush, valley-foothill hardwood, pine-juniper, and annual grass at elevations from below sea level to 1830 m. This species prefers open sandy areas with scattered brush, as well as rocky areas. Primarily nocturnal, glossy snakes spend periods of inactivity during the day and during winter in mammal burrows and rock outcrops, and to a lesser extent under surface objects such as flat rocks and vegetation residue.

The Project site could provide some upland habitat, including nesting opportunities during fallow periods, for this species. However, the Project site does not contain open sandy areas with scattered brush or rocky areas. Regular disking and mowing on-site for agriculture and weed/vegetation abatement is a regular disturbance to refuge and foraging habitat. There is a low potential for this species to occur on-site.

CALIFORNIA TIGER SALAMANDER

The federally and State-listed Threatened California tiger salamander (CTS) is a large terrestrial salamander. It occurs in central California from the Sacramento Valley to the south-central San

Joaquin Valley, and in the surrounding foothills of both the Coast Ranges and the Sierra Nevada Mountains. CTS are also recorded from the San Francisco Bay region, Sonoma County, the Monterey Bay region, and the valleys and foothills of San Luis Obispo and Santa Barbara counties.

CTS breed in temporary wetland pools, such as vernal pools, and other seasonal wetland bodies where ponded water is present for a minimum of three to four months, extending into the early spring. Such ponds and temporary wetlands provide necessary breeding and larval-stage habitat for the species. Adults spend most of the year in aestivation, underground in the burrows of small mammals, such as the California ground squirrel and/or Botta's pocket gopher, or within other suitable subterranean retreats. They emerge at night during winter rain events for brief periods to breed (Trenham et al. 2001). Aquatic juveniles (larvae) are mostly herbivorous (Stebbins 1985). CTS normally begin to reproduce after three to five years.

There is no potential for this species to occur on-site because habitat is not present.

FOOTHILL YELLOW-LEGGED FROG

The Foothill yellow-legged frog (FYLF) is a state candidate for listing as Threatened. They occur in partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. They need at least some cobble-sized substrate for egg-laying and at least 15 weeks to attain metamorphosis. Adults often bask on exposed rock surfaces near streams. When disturbed, they dive into the water and take refuge under submerged rocks or sediments. During periods of inactivity, especially during cold weather, individuals seek cover under rocks in the streams or on shore within a few meters of water. Egg clusters are attached to gravel or rocks in moving water near stream margins. Unlike most other ranid frogs in California, this species is rarely encountered (even on rainy nights) far from permanent water. Tadpoles require water for at least three or four months while completing their aquatic development. Significant seasonal movements or migrations from breeding areas have not been reported. Normal home ranges are probably less than 10 m (33 ft) in the longest dimension. Occasional long-distance movements (up to 50 m) (165 ft) may occur during periods with high water conditions. Breeding and egg laying usually await the end of spring flooding and may commence any time from mid-March to May, depending on local water conditions. The breeding season at any locality is usually about two weeks for most populations. Females deposit eggs in clusters of 200 to 300 (range 100 to 1000). They hatch in about five days. Tadpoles reach maximum sizes of 50 to 55 mm (2.2 in) and transform in three to four months.

FYLF is known to occur in aquatic habitats, such as creeks or rivers in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along the edge. They are usually found near riffles with rocks and sunny banks nearby. The FYLF is not documented in the immediate vicinity of the Project site. Additionally, there is no potential for this species to occur on-site because habitat is not present.

CALIFORNIA RED-LEGGED FROG

The federally-listed Threatened and California Species of Special Concern California red-legged frog (CRLF) occurs in lowlands and foothills primarily in perennial or ephemeral ponds, pools, and streams where water remains long enough (14 to 28 weeks) for breeding and metamorphosis of tadpoles. Specific breeding sites include streams, creeks, ponds, marshes, sag ponds, deep pools, backwater areas, dune ponds, lagoons, and estuaries. Habitats with the highest densities of CRLF often contain dense emergent or shoreline riparian vegetation closely associated with shallow (< 0.5 meter) to deep (> 0.5 meter), still or slow-moving water (USFWS 2002). CRLF may disperse from their aquatic breeding habitats to upland habitats during the dry season. They prefer upland habitats that provide moisture to prevent desiccation and protection from predators including downed logs, woody vegetation, boulders, moist leaf litter, or other refugia during the dry season. When there is sufficient water at their breeding location, they may remain in aquatic habitats year-round instead of moving to adjacent uplands. During wet seasons, frogs can move long distances between habitats, traversing upland areas or ephemeral drainages. Dispersal distances are typically less than 0.5 km (0.3 mile), with a few individuals moving 2.0 to 3.6 kilometers (1.2 to 2.2 miles). Seeps and springs in open grasslands can function as foraging habitat or refugia for wandering frogs (Jennings and Hayes 1994).

There is no potential for this species to occur on-site because habitat is not present.

GIANT GARTER SNAKE

The giant garter snake (*Thamnophis gigas*) is a federal and state listed threatened species. Essential giant garter snake habitat components consist of 1) adequate water during early spring through mid-fall to provide prey base and cover, 2) emergent wetland vegetation for escape cover and foraging habitat, 3) uplands for basking and retreat sites, and 4) higher elevation upland for cover and flood refugia. The USFWS considers areas within 200 feet of aquatic habitat to represent potential upland habitat. Additionally, the USFWS identifies various levels of impact to giant garter snake habitat, from temporary to permanent, and applies mitigation requirements accordingly.

There is no potential for this species to occur on-site because habitat is not present.

WESTERN SPADEFOOT

The California Species of Special Concern western spadefoot occurs primarily in grassland habitats, but can also be found in valley-foothill hardwood woodlands. The western spadefoot requires shallow, temporary pools or streams during breeding season and egg-laying. Where natural vernal pools are absent, western spadefoots may make use of artificial ponds and stock tanks. Most of the year, western spade foots reside in burrows at depths of up to 3 feet. Adult western spadefoot movement is limited to rainy or humid nights during the breeding season; adults are rarely found on the surface at other times of the year. This species feeds mainly on invertebrates such as insects and worms.

There is no potential for this species to occur on-site because habitat is not present.

WESTERN POND TURTLE

The western pond turtle (*Emys marmorata*) is a California Species of Special Concern. Its favored habitats include streams, large rivers and canals with slow-moving water, aquatic vegetation, and open basking sites. Although the turtles must live near water, they can tolerate drought by burrowing into the muddy beds of dried drainages. This species feeds mainly on invertebrates such as insects and worms, but will also consume small fish, frogs, mammals, and some plants. Western pond turtle predators include raccoons, coyotes, raptors, weasels, large fish, and bullfrogs. This species breeds from mid to late spring in adjacent open grasslands or sandy banks.

There is no potential for this species to occur on-site because habitat is not present.

SAN JOAQUIN COACHWHIP

The San Joaquin coachwhip is a California Species of Special Concern due to extensive habitat loss and fragmentation in its restricted range, including conversion of large areas of suitable habitat to agricultural use in the San Joaquin Valley and urban development in areas of the inner Coast Ranges. The San Joaquin coachwhip occurs generally in dry, desert-like habitats as well as grasslands, chaparral, and pastures with little or no cover, and avoids dense vegetation where it cannot move quickly, including mixed oak chaparral woodland.

According to the CNDDB records search, there are no documented occurrences within 13-miles of the Project site. The majority of the Project site is currently undeveloped with some disturbance associated with agricultural uses. Previous disking on-site for agriculture likely eliminated the snake's food base and the mammal burrows it uses for refuge; therefore, this species has a low potential to occur. The San Joaquin coachwhip is a covered species under the SJMSCP.

COAST HORNED LIZARD

The coast horned lizard is a California Species of Special Concern that is not an uncommon species in the region even in the absence of records. This species requires loose sandy soil in which it can rapidly dig to avoid predators.

There is no potential for this species to occur on-site because habitat is not present.

CONCLUSION

Habitat for western pond turtle (*Emys marmorata*), giant gartersnake (*Thamnophis gigas*), coast horned lizard (*Phrynosoma blainvillii*), California tiger salamander (*Ambystoma californiense* [*A. tigrinum c.*]), foothill yellow-legged frog (*Rana boylii*), California red-legged frog (*Rana aurora draytoni*), and western spadefoot (*Spea hammondii*) is not found on-site.

Potential habitat for California glossy snake (*Arizona elegans occidentalis*) and San Joaquin coachwhip (*Masticophis flagellum ruddocki*) is found on-site. California glossy snake is not covered under the SJMSCP. San Joaquin coachwhip is covered under the SJMSCP. This impact is ***potentially significant***.

MITIGATION MEASURE(S)

*Implement **Mitigation Measure 3.4-2**.*

Mitigation Measure 3.4-3: *The Project applicant shall implement the following measure to avoid or minimize impacts on California glossy snake:*

- *Prior to the commencement of construction activities, but not more than two (2) days before ground clearance, a qualified biologist shall conduct pre-construction surveys of the Project site for California glossy snake (Arizona elegans occidentalis). If individuals of this species are discovered, a qualified biologist shall capture and translocate individuals to similar habitat in the general vicinity of the Project site. The translocation process shall be conducted until it is determined that all California glossy snake have been removed from the disturbance boundary. The candidate sites for relocation shall be identified before construction and shall be selected based on the size and type of habitat present, the potential for negative interactions with resident species, and the species' range. A final report identifying the number of animals moved and any mortality identified during the relocation event shall be completed at the end of construction. The disturbance zone shall be cleared of vegetation as soon after clearance of these species as possible to ensure the species do not re-enter the disturbance area. As part of the worker environmental training awareness program, Project personnel shall be trained to identify this species, its natural history, its habitat, and protective measures.*

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Mitigation Measure 3.4-2 requires the Project proponent to obtain coverage under the SJMSCP to mitigate for habitat impacts to covered special-status species, including valley elderberry longhorn beetle. Coverage involves compensation for habitat impacts on covered species through implementation of ITMMs and payment of fees for conversion of lands that may provide habitat for covered special-status species. These fees are used to preserve and/or create habitat in preserves to be managed in perpetuity. Additionally, Mitigation Measure 3.4-3 requires a preconstruction survey for California glossy snake and translocation should this species be found.

With implementation of these mitigation measures, the proposed Project would have a ***less than significant*** impact on special-status reptile and amphibian species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a reptile and amphibian community, or a drop in population levels below self-sustaining levels.

Impact 3.4-3: Implementation of the proposed Project, with mitigation, would not have substantial direct or indirect effects on special-status bird species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a bird community, or a drop in population levels below self-sustaining levels. (Less than Significant with Mitigation)

According to the CNDDB, there are 13 special-status birds that are documented within the nine-quadrangle Project region, including: cackling (=Aleutian Canada) goose (*Branta hutchinsii leucopareia*), California black rail (*Laterallus jamaicensis coturniculus*), tricolored blackbird

(Agelaius tricolor), burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), white-tailed kite (*Elanus leucurus*), California horned lark (*Eremophila alpestris actia*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), loggerhead shrike (*Lanius ludovicianus*), merlin (Falco columbarius), song sparrow ("Modesto" population) (*Melospiza melodia*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), and least Bell's vireo (*Vireo bellii pusillus*). As noted in Table 3.4-4, all but one of these bird species (least Bell's vireo) are covered species under the SJMSCP.

The Project area may provide suitable foraging habitat for a variety of potentially occurring special-status birds, including those listed above. Potential nesting habitat is present in a variety of trees located within the Project site and in the vicinity. There is also the potential for other special-status birds that do not nest in this region and represent migrants or winter visitants to forage in the Project site.

The potential to have substantial direct or indirect effects on special-status bird species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a bird community, or a drop in population levels below self-sustaining levels, is discussed below.

YEAR-ROUND BIRDS

Special-status birds that can be present in the region throughout the year include: burrowing owl (*Athene cunicularia*), loggerhead shrike *(Lanius ludovicianus*), song sparrow ~~(Modesto population)~~ (*Melospiza melodia*), tricolored blackbird *(Agelaius tricolor*), among others. Some of these species are migratory, but also reside year-round in California.

SUMMERING BIRDS

Special-status birds that are only present in the region in the spring and summer months include: Aleutian goose (*Branta canadensis leucopareia*), Swainson's hawk (*Buteo swainsoni*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), least Bell's vireo (*Vireo bellii pusillus*), California horned lark (*Eremophila alpestris actia*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*).

OVERWINTERING BIRDS

Special-status birds that are only present in the region in the fall and winter months include: merlin *(Falco columbarius*).

NESTING RAPTORS (BIRDS OF PREY)

All raptors (owls, hawks, eagles, falcons), including species and their nests, are protected from take pursuant to the Fish and Game Code of California Section 3503.5, and the federal Migratory Bird Treaty Act, among other federal and State regulations. Special-status raptors that are known to occur in the region include: burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), and white-tailed kite *(Elanus leucurus*), among others.

ANALYSIS

Powerlines and trees located in the region represent potentially suitable nesting habitat for a variety of special-status birds. Powerlines and trees exist throughout the region, including in the Project site. The agricultural land represents potentially suitable nesting habitat for the ground-nesting birds. In general, most nesting occurs from late February and early March through late July and early August, depending on various environmental conditions. Additionally, highly mobile species could pass through the site.

Swainson's hawk: Swainson's hawk is state threatened and is a migrant species that spends much of the spring, summer, and early fall in California's Central Valley. Their preferred nesting habitat consists of valley oaks, cottonwoods, and other tall trees adjacent to both agricultural fields and grasslands. They have been observed more frequently in recent years within the Central Valley. Due to the recent expansion of their population, it is possible that agricultural, grassland, and rural residential areas may support foraging and possibly nesting hawks. However, the ruderal grasses, fallow ground, and trees in the northern and eastern portion of the Project site are not considered quality habitat for foraging or nesting. This species generally prefers open fields for foraging, and tall trees for nesting. There are three CNDDB records of this species within 0.1-mile of the site. The Project site is within the range of documented Swainson's hawk, and given the high mobility of the species, it is possible that an individual could be present on the site at some future time even though none have been observed or recorded in the past.

Burrowing owl: Burrowing owl is a species of concern in California. It is a small owl that typically lives in grassland habitats of the Central Valley region that also support California ground squirrels. The species will also sometimes overwinter or even nest within agricultural areas, using whatever is available (pipes, ground holes/burrows). The owl seeks shelter and breeds from February to July. Although the numbers of owls have declined in some parts of California over the past 20 years, their numbers have increased greatly in some agricultural areas. Suitable nesting and foraging habitat for this species is present on-site. The nearest CNDDB record is approximately 2.23 miles northeast or further from the Project site. No active nesting was observed on-site. The Project site is within the range of this species and given the high mobility of the species, it is possible that an individual could be present on the site at some future time.

White-tailed kite: White-tailed kite is a CDFW Fully Protected species. This non-migrating bird typically attains a wingspan of approximately 40 inches and feeds primarily on insects, small mammals, reptiles, and amphibians, which it forages from open grasslands. It builds a platform-like nest of sticks in trees or shrubs and lays 3 to 5 eggs, but may brood a second clutch if prey is abundant. The kite's distinct style of hunting includes hovering before diving onto its target. Suitable foraging habitat and nesting opportunities for this species are present on-site. There are no CNDDB records within eight miles of the site; however, this highly mobile species could pass through and could establish nests in future years.

Cackling (=Aleutian Canada) goose: Cackling (=Aleutian Canada) goose is listed by CDFW as a Watch List species. They roost in large marshes, flooded fields, stock ponds, and reservoirs and forage in pastures, meadows, and harvested grainfields. The Project site does not provide the appropriate habitat for this species; however, this highly mobile species could pass through and could establish nests in future years.

California black rail: California black rail is listed by CDFW as a Threatened species. They inhabit freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. This species requires water depths of about one inch that do not fluctuate during the year and dense vegetation for nesting habitat. No known CNDDB occurrences exist within 11 miles of the Project site. The Project site does not provide the appropriate aquatic habitat for this species.

Tricolored blackbird: Tricolored blackbirds are listed by CDFW as a Threatened species. During the breeding season, tricolored blackbirds typically nest in dense colonies (some estimated as having 200,000+ nests), with males defending small territories and mating with one to four females. Studies have shown that nesting colonies are often located in seasonal wetlands with tules and cattails present. More recent studies indicate that nesting colonies are also regularly found in Himalayan blackberries (*Rubus discolor*) and grain fields. Other substrates where they have been observed nesting include giant European reed (*Arundo donax*), safflower (*Carthamus tinctorius*), tamarisk (*Tamarix* spp.), elderberry (*Sambucus* spp.), poison-oak (*Toxicodendron diversilobum*), and riparian scrublands and forests (e.g., *Salix*, *Populus*, and *Fraxinus* spp.).

Tricolored blackbird foraging habitats in all seasons include annual grasslands, wet and dry vernal pools and other seasonal wetlands, agricultural fields (such as large tracts of alfalfa and pastures with continuous haying schedules, and recently tilled fields), cattle feedlots, and dairies. They also forage occasionally in Mixed Riparian Scrub habitats along marsh borders. Weed-free row crops, intensively managed vineyards, and orchards do not serve as regular foraging sites (Beedy and Hamilton 1997, 1999; DeHaven 2000). CNDDB occurrences for this species exist within 2.3 miles of the Project site. The Project site does not contain suitable nesting habitat for this species. The potential for this species to occur on-site is low; however, this highly mobile species could pass through and could establish nests in future years.

California horned lark: This species is listed by CDFW as a Watch List species. They prefer to forage in large groups in open grasslands, nesting in hollows on the ground, and are also regularly found breeding on the Valley floor in suitable habitat. The Project site contains suitable habitat for this species. There are no CNDDB record within 10 miles of the site. No active nesting was observed on-site. The potential for this species to occur on-site is low; however, this highly mobile species could pass through and could establish nests in future years.

Yellow-headed blackbird: Yellow-headed blackbird is CDFW listed as a species of special concern. They nest in freshwater emergent wetlands with dense vegetation and deep water. They are often found along borders of lakes or ponds and only nest where large insects, such as *Odonata* are abundant. Nesting is timed with maximum emergence of aquatic insects. The Project site contains marginal habitat for this species; nesting opportunities on-site are absent. The potential for this species to occur on-site is low; however, this highly mobile species could pass through and could establish nests in future years.

Loggerhead shrike: Loggerhead shrike is listed by CDFW as a species of special concern. Loggerhead shrikes occur in dry, open habitats including grasslands, pastures with fence rows, agricultural fields, open woodlands (savannas), scrub, and riparian areas. They inhabit open areas with clear visibility for hunting, perches for scanning, and scattered small trees and large shrubs for nesting. Loggerhead shrikes typically avoid completely treeless and shrubless areas (Cade and Woods 1997), as well as urbanized and densely wooded areas (Grinnell and Miller 1944). Winter foraging habitat is like summer breeding and foraging habitat; however, shrikes also use idle pastures and hayfields during the winter (Bartgis 1992). The Project site contains marginally suitable habitat for this species. The potential for this species to occur on-site is low; however, this highly mobile species could pass through and could establish nests in future years.

Merlin: The Merlin is a CDFW species of special concern that has never been observed nesting in California. Though it is a transient throughout most of the state, wintering populations are known to occur in the Central Valley and along the coast. The Project site does not contain suitable nesting habitat for this species.

Song sparrow: Song sparrows are listed by CDFW as a species of special concern due to declining populations in the Great Central Valley of California. They prefer open grasslands with barren ground for foraging and tend to be found in areas with vegetation and scrub cover especially in grasslands and prairies. The Project site does not contain suitable habitat for this species.

Western yellow-billed cuckoo: Western yellow-billed cuckoo is CDFW listed as Endangered. They are found in riparian forest nester, along the broad, lower flood-bottoms of larger river systems. They nest in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape. The Project site does not contain suitable habitat for this species.

Least Bell's vireo: This species is listed by CDFW as a federal and CDFW Endangered species. They are found in the Central Valley of California and other low-elevation river valleys. They prefer dense brush, mesquite, willow-cottonwood forest, streamside thickets, and scrub oak. The Project site does not contain suitable nesting habitat for this species. Nesting opportunities are absent from the site, but this highly mobile species could pass through.

In addition to the species described above, common raptors and migratory birds may nest in or adjacent to the Project site.

CONCLUSION

New sources of noise and light during the construction and operational phases of the Project could adversely affect nesters if they are located adjacent to the Project site in any given year. Additionally, the proposed Project would eliminate the agricultural areas on the Project site, which serve as potential foraging habitat for birds throughout the year. All of the species discussed above which have a low to high potential to occur on-site are covered by the SJMSCP. Mitigation Measure 3.4-2 requires participation in the SJMSCP. As part of the SJMSCP, SJCOG requires preconstruction surveys for projects that occur during the avian breeding season (March 1 – August 31). When active nests are identified, the biologists develop buffer zones around the active nests as deemed appropriate until the young have fledged. SJCOG also uses the fees to purchase habitat as compensation for the loss of foraging habitat. Implementation of the proposed Project, with the Mitigation Measure 3.4-2, would ensure that potential impacts to special-status birds are reduced to a ***less than significant*** level.

MITIGATION MEASURE(S)

*Implement **Mitigation Measure 3.4-2**.*

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Mitigation Measure 3.4-2 requires the Project proponent to obtain coverage under the SJMSCP to mitigate for habitat impacts to covered special-status species, including valley elderberry longhorn beetle. Coverage involves compensation for habitat impacts on covered species through implementation of ITMMs and payment of fees for conversion of lands that may provide habitat for covered special-status species. These fees are used to preserve and/or create habitat in preserves to be managed in perpetuity.

With implementation of this mitigation measure, the proposed Project would have a ***less than significant*** impact on special-status bird species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a bird community, or a drop in population levels below self-sustaining levels.

Impact 3.4-4: Implementation of the proposed Project, with mitigation, would not have substantial direct or indirect effects on special-status mammal species, including through substantial reduction of habitat, substantial reduction of the number or restriction of the range of a listed species, elimination of a mammal community, or a drop in population levels below self-sustaining levels. (Less than Significant with Mitigation)

According to the CNDDB, there are eight special-status mammals that are documented within the nine-quadrangle Project region, including: pallid bat (*Antrozous pallidus*), riparian (=San Joaquin Valley) woodrat (*Neotoma fuscipes riparia*), Townsend's big-eared bat (*Corynorhinus townsendii*), western mastiff bat (*Eumops perotis californicus*), San Joaquin pocket mouse (*Perognathus inornatus*), riparian brush rabbit (*Sylvilagus bachmani riparius*), American badger (*Taxidea taxus*), and San Joaquin kit fox (*Vulpes macrotis mutica*). As noted in Table 3.4-4, all but one of these mammal species (pallid bat) are covered species under the SJMSCP.

The potential to have substantial direct or indirect effects on special-status mammal species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a mammal community, or a drop in population levels below self-sustaining levels, is discussed below.

RIPARIAN WOODRAT

This species requires wide, dense riparian forests with a thick understory of willows for nesting, while sites with a dominant cottonwood overstory are preferred for foraging. The Project site does not contain suitable habitat for this species.

RIPARIAN BRUSH RABBIT

Lake the riparian woodrat species, the riparian brush rabbit requires native valley riparian habitats with large clumps of dense shrubs, low-growing vines, and some tall shrubs and trees. The Project site does not contain suitable habitat for this species.

SAN JOAQUIN POCKET MOUSE

The majority of the Project site is currently undeveloped with some disturbance associated with agricultural uses. Disking on-site for agriculture likely eliminates high quality habitat for the San Joaquin pocket mouse, which is primarily found in grassland, oak savanna, and arid scrubland in areas with fine-textured, sandy, and friable soils. The closest documented occurrence of San Joaquin pocket mouse is approximately 7.8 miles west of the Project site. It is noted that during fallow periods, the site improves for this species, until it is disked for weed abatement on-site. There is low potential for this species to occur on-site.

AMERICAN BADGER

As noted previously, the majority of the Project site is currently undeveloped with some disturbance associated with agricultural uses. Disking on-site for agriculture likely eliminated high quality habitat for the American badger, which is primarily found in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. The closest documented occurrence of American badger is approximately 6.3 miles southwest of the Project site. This species is highly mobile and will forage where opportunities exist. During fallow periods, the site improves for this species. There is low potential for this species to occur on-site.

SAN JOAQUIN KIT FOX

San Joaquin kit fox is known to occur in western San Joaquin County within annual grasslands and alkali scrub communities with suitable prey base and loose-textured sandy soils where dens can be enlarged from California ground squirrel burrows. According to the CNDDB, the nearest occurrence of the San Joaquin kit fox is approximately 11 miles southwest of the Project site. Low quality grassland foraging habitat occurs in the vicinity of the Project site where ground squirrels are abundant. This is a highly mobile species. Overall, there is a low potential for the San Joaquin Kit Fox to forage on the Project site at times, especially during fallow periods. There were no dens present on-site during the reconnaissance level site survey, and the active agricultural operations adjacent to the site, as well as the regular disking of the site for weed abatement, inhibit any establishment of dens.

SPECIAL-STATUS BATS

The CNDDB also identifies several special-status bats that occur within the 9-quad region of the Project site, including: Pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Eumops perotis californicus*), and Western mastiff bat (*Eumops perotis californicus*). These species are not federally state listed; however, they are considered a California Species of Special Concern and are tracked by the CNDDB. Development of the Project site would eliminate foraging habitat for special-status bats by removing the agricultural areas. These special-status bat species are covered by the SJMSCP, except for the pallid bat.

Pallid bats occur in a variety of habitats from desert to coniferous forest, but are most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California. This species relies heavily on trees for roosts. The Project site has appropriate roosting habitat to support the pallid bat. There are no CNDDB record within approximately 14 miles of the site. Because bats are highly mobile, pallid bats are anticipated to occur within the Project site.

The remaining special-status bat species (i.e., Townsend's big-eared bat and Western mastiff bat) have not been documented on the Project site. These special-status bat species, or evidence of bat presence (i.e. guano), were not observed during the field surveys; however, the Project site contains appropriate roosting habitat to support the bats, and they are highly mobile and may be present on adjacent properties or the Project site. The existing residence and associated structures could provide roosting habitat. These structures would be demolished as part of the project. Development of the Project site would also eliminate foraging habitat for special-status bats by removing the agricultural areas. These special-status bat species are all covered species under the SJMSCP.

MITIGATION MEASURE(S)

*Implement **Mitigation Measure 3.4-2**.*

Mitigation Measure 3.4-4: *The Project applicant shall implement the following measure to avoid or minimize impacts on special-status bat species:*

- *Prior to grading of each phase, the Project applicant shall conduct a survey of the area to be graded for bat roosts, and if present, the Project applicant shall implement the following measures to avoid or minimize impacts on special-status bats:*
    - *If removal of suitable roosting areas (i.e., buildings, trees, shrubs, bridges, etc.) must occur during the bat pupping season (April 1 through July 31), surveys for active maternity roosts shall be conducted by a qualified biologist. The surveys shall be conducted from dusk until dark.*
    - *If a special-status bat maternity roost is located, appropriate buffers around the roost sites shall be determined by a qualified biologist and implemented to avoid destruction or abandonment of the roost resulting from habitat removal or other project activities. The size of the buffer shall depend on the species, roost location,*

and specific construction activities to be performed in the vicinity. No project activity shall commence within the buffer areas until the end of the pupping season (August 1) or until a qualified biologist confirms the maternity roost is no longer active.

- *If a non-maternal roost is located, eviction and exclusion techniques shall be conducted as recommended by the qualified biologist. Methods may include opening the roosting area to change the air flow and lighting, installing one-way doors, or other appropriate methods that allow the bats to exit and find a new roost. After eviction is believed to be completed, acoustic monitoring, and an evening emergence survey shall be performed by the qualified biologist to ensure eviction is complete. For tree removal, a two-step tree removal process involving removal of all branches that do not provide roosting habitat on the first day, and then the next day cutting down the remaining portion of the tree.*

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Mitigation Measure 3.4-2 requires the Project proponent to obtain coverage under the SJMSCP to mitigate for habitat impacts to covered special-status species, including valley elderberry longhorn beetle. Coverage involves compensation for habitat impacts on covered species through implementation of ITMMs and payment of fees for conversion of lands that may provide habitat for covered special-status species. These fees are used to preserve and/or create habitat in preserves to be managed in perpetuity.

Mitigation Measure 3.4-4 requires a survey for bat roosts, as well as buffers, if needed, around the roost sites. Implementation of the above mitigation measures would ensure that potential impacts to special-status bats are reduced to a ***less than significant*** level. There would be no substantial direct or indirect effects on any special-status mammal species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a mammal community, or a drop in population levels below self-sustaining levels.

Impact 3.4-5: Implementation of the proposed Project would not have substantial direct or indirect effects on candidate, sensitive, or special-status plant species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a plant community, or a drop in population levels below self-sustaining levels. (Less than Significant)

The records search identified 25 documented special-status plant species within the nine-quadrangle Project region. These 25 special-status plants include: bristly sedge (*Carex comosa*), Large-flowered fiddleneck (*Amsinckia grandiflora*), alkali-sink goldfields (*Lasthenia chrysantha*), Alkali milk-vetch (*Astragalus tener var. tener*), Heartscale (*Atriplex cordulata var. cordulata*), Lesser saltscale (Atriplex minuscula), Big tarplant (*Blepharizonia plumosa*), Palmate-bracted bird's-beak (*Chloropyron palmatum*), Recurved larkspur (*Delphinium recurvatum*), diamond-petaled California poppy (*Eschscholzia rhombipetala*), San Joaquin spearscale (*Extriplex joaquinana*), Sanford's arrowhead (*Sagittaria sanfordii*), Woolly rose-mallow (*Hibiscus lasiocarpos var. occidentalis*), Wright's trichocoronis (*Trichocoronis wrightii var. wrightii*), Mason's lilaeopsis (*Lilaeopsis masonii*), Delta mudwort (*Limosella australis*), Delta button-celery (*Eryngium racemosum*), Delta tule pea (*Lathyrus jepsonii var. jepsonii*), slough thistle (*Cirsium crassicaule*), Suisun Marsh aster (*Symphyotrichum lentum*), Showy golden madia (*Madia radiata*), California alkali grass (*Puccinellia simplex*), Saline clover (*Trifolium hydrophilum*), Caper-fruited tropidocarpum (*Tropidocarpum capparideum*), and watershield (*Brasenia schreberi*).

Of the 25 documented species, two are federally listed (two endangered), four are state listed (three endangered and one rare), 21 are CNPS 1B listed species (including the federal and state listed species), and four are CNPS 2 listed species. As noted in Table 3.4-3, 17 of the 25 are covered species under the SJMSCP.

The Project site was subject to a field survey by Principal Biologist Steve McMurtry on July 13, 2022 and April 15, 2023. The collection of field surveys included surveys that coincided with the blooming period for most special-status plants known to occur within the region.

The majority of the Development Area contains agricultural uses with row crops and fields which are highly disturbed. The agricultural crops and fields are mostly bare, tilled and fallow after seasonal harvest. Typical invasive weeds and plants such as wild radish, datura, goats-head, brome and Russian thistle were present around the perimeter of the agricultural fiends and along edges of dirt access roads. Native valley oaks are present in several places along the Project site boundaries and near the building complex. Ornamental imported trees are also found near the barns and house.

SJMCP Covered Special-Status Plant Species: Of the 25 special-status species which may occur in the Project area, 17 are covered under the SJMSCP. Therefore, any impacts to these species would be ***less than significant*** through compliance with Mitigation Measure 3.4-2, which requires the Project proponent to obtain coverage under the SJMSCP to mitigate for habitat impacts to covered special-status species.

Remaining Special-Status Plant Species: The remaining eight plant species are not covered by the SJMSCP include: alkali-sink goldfields, lesser saltscale, big tarplant, palmate-bracted bird's-beak, San Joaquin spearscale, California alkali grass, saline clover, and watershield. No special-status plant species were observed within the Project site during the field survey and none are expected to be affected by the proposed Project. Due to the extent of past disturbance from agricultural production and other development activities in the area, the potential for these species-status plant species to occur on the Project site is generally considered to be low. It is noted that if given time without disturbance it is possible for the plant composition to shift away from it’s current ruderal grass composition. However, for the reasons presented above, the proposed Project would have a ***less than significant*** impact on special-status plants.

CONCLUSION

The Specific Plan is designed to place new development in areas that are previously disturbed by agricultural activity, and to conserve those areas that are largely undisturbed (i.e., corridor along the San Joaquin River and bluff area). There are no special-status plants located within the agricultural fields that are planned for development. Implementation of the proposed Project would have a ***less than significant*** impact on special-status plant species.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.4-6: Implementation of the proposed Project would not have substantial direct or indirect effects on candidate, sensitive, or special-status fish species, including through substantial reduction of habitat, substantial reduction of the number or restriction in the range of a listed species, elimination of a fish community, or a drop in population levels below self-sustaining levels. (Less than Significant)

The records search identified five documented special-status fish species within the nine-quadrangle Project region. These five special-status fish include: Delta smelt (*Hypomesus transpacificus*), green sturgeon - southern DPS (*Acipenser medirostris pop. 1*), hardhead (*Mylopharodon conocephalus*), steelhead - Central Valley DPS (*Oncorhynchus mykiss irideus pop. 11*), and Longfin smelt (*Spirinchus thaleichthys*). Of the five documented species, three are federally threatened. As noted in Table 3.4-4, three of the five special-status fish species are covered species under the SJMSCP.

The Development Area does not contain any aquatic habitats, including but not limited to streams, rivers, wetlands, estuaries, or pools. Although the Project site is bordered by the San Joaquin River, the Project includes 38.2 acres of undeveloped land along the San Joaquin River. Aquatic habitats in some form are required for all the aforementioned special-status fish species. Therefore, the site does not contain habitat for these species. For these reasons, the proposed Project would have a ***less than significant*** impact on special-status plants.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.4-7: Implementation of the proposed Project would not cause a substantial adverse effect on protected wetlands and jurisdictional waters. (No Impact)

The Development Area does not contain protected wetlands or other jurisdictional areas and there is no need for permitting associated with the federal or state Clean Water Acts. As noted above, the Project site is bordered by the San Joaquin River. The Project includes 38.2 acres of undeveloped land along the San Joaquin River. The Project site was previously used for agricultural uses. At times the Project site is fallow, and forms an annual grassland composed of non-native annuals, before it is disked for weed abatement on-site. Absent any wetlands or jurisdictional waters, implementation of the proposed Project would have ***no impact*** relative to this topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

No Impact

MITIGATION MEASURE(S)

None required.

Impact 3.4-8: Implementation of the proposed Project would not result in adverse effects on riparian habitat or other sensitive natural community. (No Impact)

The CNDDB record search revealed documented occurrences of five sensitive habitats within the 9-quad region for the Project site including: Coastal and Valley Freshwater Marsh, Great Valley Cottonwood Riparian Forest, Great Valley Mixed Riparian Forest, Great Valley Valley Oak Riparian Forest, and Elderberry Savanna. None of these sensitive natural communities occur within the Project site. Implementation of the proposed Project would have ***no impact*** on riparian habitats or natural communities.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

No Impact

MITIGATION MEASURE(S)

None required.

Impact 3.4-9: Implementation of the proposed Project would not interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (Less than Significant)

The CNDDB record search did not reveal any documented wildlife corridors or wildlife nursery sites on or adjacent to the Project site. As noted above, five special-status fish species are documented within the region, including: species within the nine-quadrangle Project region. These five special-status fish include: Delta smelt (*Hypomesus transpacificus*), green sturgeon - southern DPS (*Acipenser medirostris pop. 1*), hardhead (*Mylopharodon conocephalus*), steelhead - Central Valley DPS (*Oncorhynchus mykiss irideus pop. 11*), and Longfin smelt (*Spirinchus thaleichthys*). The closest major natural movement corridor for native fish that is documented in the region is the San Joaquin River, located adjacent to the Project site, and its tributaries. The proposed land use within the Development Area would not have any direct disturbance to the San Joaquin River and its tributaries, and therefore, would not have any direct disturbance to the movement corridor or habitat. Implementation of the Project would result in a ***less than significant*** impact related to this topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.4-10: Implementation of the proposed Project, with mitigation, would not conflict with an adopted Habitat Conservation Plan. (Less than Significant with Mitigation)

The proposed Project is subject to the SJMSCP. The proposed Project does not conflict with the SJMSCP. Mitigation Measure 3.4-2 requires participation in the SJMSCP. Therefore, with this mitigation, the proposed Project would have a ***less than significant*** impact relative to this topic.

MITIGATION MEASURE(S)

*Implement **Mitigation Measure 3.4-2**.*

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Mitigation Measure 3.4-2 requires the Project proponent to obtain coverage under the SJMSCP to mitigate for habitat impacts to covered special-status species, including valley elderberry longhorn beetle. Coverage involves compensation for habitat impacts on covered species through implementation of ITMMs and payment of fees for conversion of lands that may provide habitat for covered special-status species. These fees are used to preserve and/or create habitat in preserves to be managed in perpetuity.

Implementation of the above mitigation measure would ensure that potential impacts associated with conflicts with an adopted Habitat Conservation Plan are reduced to a ***less than significant*** level.

Impact 3.4-11: Implementation of the proposed Project, with mitigation, would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant with Mitigation)

The General Plan establishes numerous policies and actions related to biological resources and development review. These policies and actions are listed below. Additionally, the City's Municipal Code outlines regulations intended to protect biological resources and water quality. The Project's consistency with these General Plan policies and actions and the Municipal Code requirements are also described.

RECREATION AND RESOURCES ELEMENT POLICIES AND ACTIONS

RR-4.1: Sensitive Communities. Protect, conserve, and enhance Lathrop's biological resources, with a special focus on sensitive, rare, or endangered plant and wildlife species in accordance with state and federal resource agency requirements.

- ***Consistent**: This EIR includes an in-depth analysis of impacts related to biological resources, including the potential for impacts to sensitive, rare, or endangered plants and wildlife, as well as habitat. Where impacts are identified, mitigation measures are presented to minimize, avoid, or compensate to the extent practicable.*

RR-4.2: Habitat Conservation. Support habitat conservation efforts to set aside and preserve suitable habitats, with priority given to habitats for rare and endangered species in accordance with state and federal resource agency requirements.

- ***Consistent**: This EIR provides a detailed overview of the applicable regulatory requirements to ensure the Project complies with all federal, State, and regional regulations for habitat and species protections. Additionally, this EIR includes an in-depth analysis of impacts for sensitive plants and wildlife, as well as habitat. Limited habitat exists on-site. Where impacts are identified, mitigation measures are presented to minimize, avoid, or compensate to the extent practicable.*

RR-4.3: Native Species. Conserve existing native trees and vegetation where possible and encourage the use of native species in development and infrastructure projects.

- ***Consistent**: According to the Specific Plan, "Plant species and planting themes have been selected to mimic characteristics and habitat of delta waterways and agricultural landscapes. It is highly recommended to utilize plant material that is drought tolerant, durable and long-lived. Species should be well adapted to the climatic conditions and soil types of the project." Invasive tree species would be avoided.*

RR-4.4: Natural Water Bodies and Drainage Systems. Limit the disturbance of natural water bodies and drainage systems in Lathrop by conserving natural open space areas, protecting channels, and minimizing the impacts from stormwater and urban runoff.

- ***Consistent****: There are no natural water bodies in the Development Area. However, the San Joaquin River borders the Project site. The Project site is designated for Low Density Residential (LD) uses in the City's General Plan. As discussed in Chapter 2.0, Project Description, development of the proposed Project would include construction of a new storm drainage system. The storm drain lines in each individual residential street in Mossdale Landing West will drain towards the main line in Towne Centre Drive, which crosses River Islands Parkway and connects to an existing main near the intersection of Village Avenue. Water will then travel via gravity to the existing pump station located in the southwest corner of the Mossdale Landing Community Park, which will eventually pump the water into the San Joaquin River. Upgrades to the existing pump and storm drain system will be determined.*

RR-4.6: Urban Forest. To the extent feasible, build upon existing streetscapes and develop an urban forest along the City's major corridors and in residential neighborhoods to provide avian habitat, sequester carbon emissions, foster pedestrian activity, and provide shade.

- ***Consistent****: The Specific Plan includes landscape architecture standards. Landscaping would be provided throughout the Plan Area, such as along roadways, paths, and parks. Tree species with invasive characteristics would be avoided. When selecting plant species, species that would minimize maintenance challenges would be preferred. Evergreen shrubs would be utilized where appropriate for screening of fences or utility structures. A mix of deciduous and evergreen tree varieties would be utilized to create interest throughout the seasons. Traditional "lawn" species would be highly discouraged in parkway strips and should be limited to parks and public open spaces for recreational use. Further, deep rooting species that use less water would be utilized when "lawn" species are used.*

RR-4.11: Development. Require that all new development identify potential impacts to existing biological resources and provide mitigation measures as necessary pursuant to CEQA to protect these resources from negative externalities.

- ***Consistent****: This EIR provides a detailed overview of the applicable regulatory requirements to ensure the Project complies with all federal, State, and regional regulations for habitat and species protections. Additionally, this EIR includes an in-depth analysis of impacts for sensitive plants and wildlife, as well as habitat. Where impacts are identified, mitigation measures are presented to minimize, avoid, or compensate to the extent practicable.*

RR-4a: Cooperate with state, federal, and local agencies to ensure that development does not cause significant adverse impacts to existing riparian corridors.

- ***Does Not Conflict****: The Development Area does not contain any riparian corridors. Although the Project site is bordered by the San Joaquin River and associated adjacent habitat, the Project includes 38.2 acres of undeveloped land along the San Joaquin River.*

RR-4b: Require new development, infrastructure, long-range planning, and similar projects, to comply with the requirements of the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan to ensure that potentially significant impacts to special-status species and sensitive resources are adequately addressed.

- ***Consistent**: The proposed Project is subject to the SJMSCP. The proposed Project does not conflict with the SJMSCP. Mitigation Measure 3.4-2 requires participation in the SJMSCP.*

RR-4c: Require new development which has the potential to result in water quality impacts to the City's waterways and the local groundwater basin to implement all feasible mitigation measures to reduce impacts.

- ***Consistent**: As discussed in Impact 3.9-2 in Section 3.9, Hydrology and Water Quality, the Project would not decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin. As also discussed in Section 3.9, the Project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.*

RR-4e: Where sensitive biological habitats have been identified on or immediately adjacent to a project site, the project shall include appropriate mitigation measures identified by SJMSCP, which may include, but are not limited to the following:

A. Pre-construction surveys for species listed under the State or Federal Endangered Species Acts, or species identified as special-status by the resource agencies, shall be conducted by a qualified biologist;

B. Construction barrier fencing shall be installed around sensitive resources and areas identified for avoidance or protection, and to reduce potential soil compaction in sensitive areas; and

C. Pre-Construction training of contractors and sub-contractors shall be conducted by a qualified biologist to identify and avoid protected species and habitat.

- ***Consistent**: As noted previously, the proposed Project is subject to the SJMSCP. Mitigation Measure 3.4-2 requires participation in the SJMSCP.*

RR-7d: Review and regulate new development, infrastructure, and levee improvement projects to ensure consistency with Federal and State flood and floodway requirements, including BDCP and Delta Plan policies as applicable.

- ***Consistent**: Impacts associated with potential flood events are discussed in Section 3.9, Hydrology and Water Quality, of this EIR. As discussed, the Development Area is not within the 100- or 500-year flood hazard zones. While portions of the Project site outside of the Development Area are located in the 100-year flood zone, these portions would be open space as part of the Project. Development of urban uses within the 100-year flood zone would not occur as a result of the Project. Furthermore, the majority of the Project site is located in the 200-year floodplain. However, pursuant to the City Municipal Code, the proposed Project would be required to comply with regulations contained in Chapter 17.17 (200-Year Flood Protection) of the City Municipal Code.*

LATHROP MUNICIPAL CODE

The Lathrop Municipal Code provides rules and regulations to protect water courses (Chapter 12.28) and to manage and control stormwater and discharge (Chapter 13.28). Section 13.28.130 specifically provides requirement to prevent, control and reduce stormwater pollutants. This includes requirements to implement best management practices to the extent they are technologically achievable to prevent and reduce pollutants.

Additionally, Chapter 12.16 outlines requirements related to trees, including planting, and removing trees. The Chapter is adopted to preserve, protect, and promote the public health, safety, peace, comfort, convenience, prosperity, and general welfare. More specifically, the Chapter is intended to achieve the following:

A. To provide a comprehensive plan for the planting, replanting, removal, and maintenance of trees within designated public streets, including arterial and collector streets and streets providing access to public facilities;
B. To establish and maintain a pattern of street trees within all public streets which will enhance the living and working area of the city, enhance real property values, conserve energy, reduce glare, diminish the effects of vehicular noise, and avoid hazards to street improvements and to public safety occasioned by trees which are of such physical location or condition as to constitute a public nuisance. (Ord. 92-89)

As noted previously, the Specific Plan includes landscape architecture standards. Landscaping would be provided throughout the Plan Area, such as along roadways, paths, and parks. Tree species with invasive characteristics would be avoided. A mix of deciduous and evergreen tree varieties would be utilized to create interest throughout the seasons. The planting and removing of trees would be subject to the requirements of Chapter 12.16; therefore, the proposed Project is consistent with Chapter 12.16.

CONCLUSION

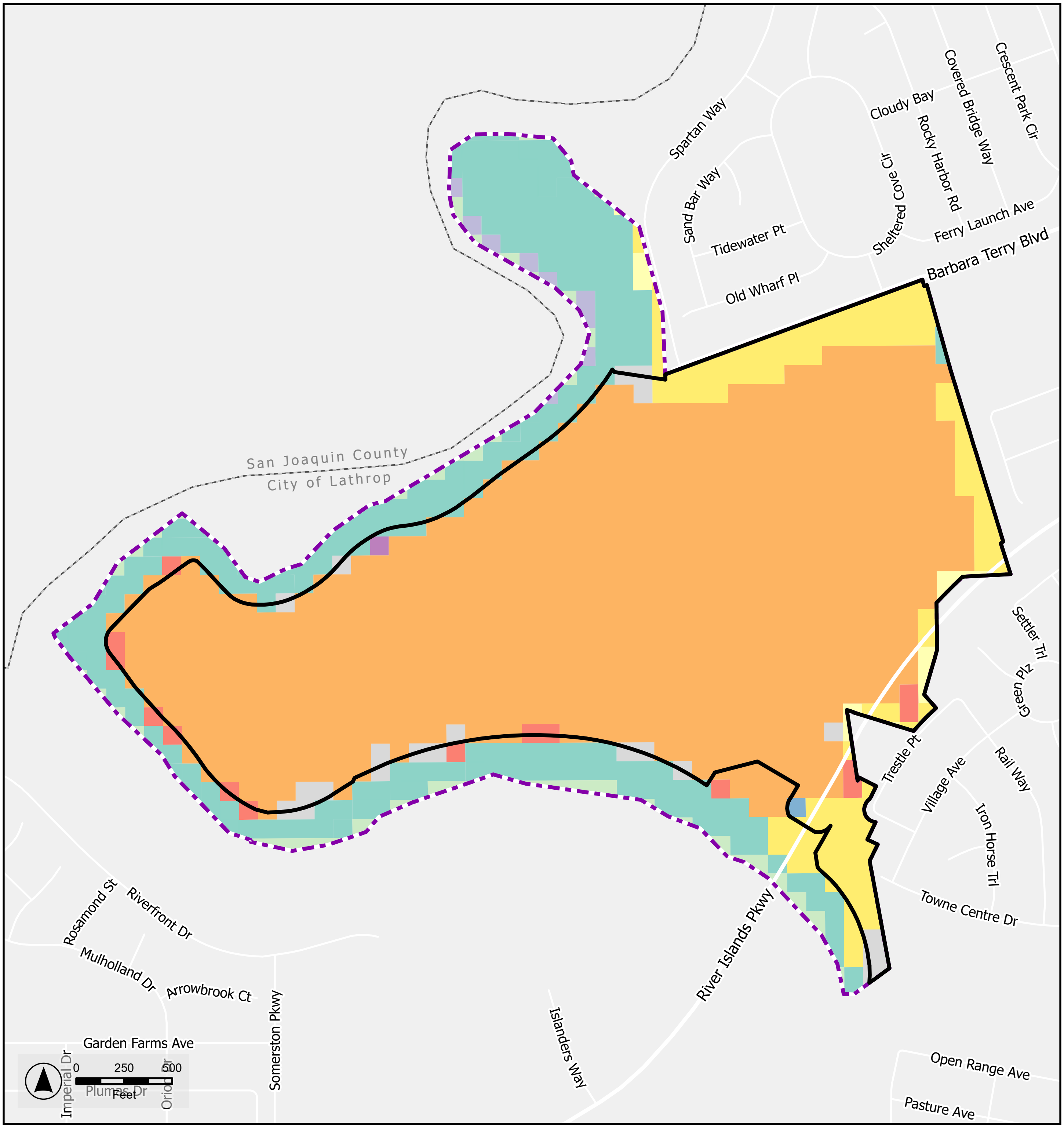
In summary, the proposed Project is substantially consistent with the local policies and ordinances protecting biological resources, such as a tree preservation policy or ordinance. The Project has been designed with ample open space, park, and trail areas to maintain open space linkages to the extent feasible. The Project would be required to comply with applicable policies to minimize impacts to special-status species and their associated habitat. Where impacts are identified, mitigation measures are presented to minimize, avoid, or compensate to the extent practicable. Therefore, this impact would be considered ***less than significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.



Legend

- Project Boundary/Development Area (167.42 acres)
- Mossdale West Project Area (225.86 acres)
- Annual Grassland
- Barren
- Coastal Scrub
- Cropland
- Deciduous Orchard
- Dryland Grain Crops
- Fresh Emergent Wetland
- Irrigated Grain Crops
- Irrigated Hayfield
- Irrigated Row and Field Crops
- Riverine
- Urban
- Valley Foothill Riparian
- Vineyard

LATHROP MOSSDALE WEST

Figure 3.4-1. Land Cover Types

Sources: FRAP Vegetation dataset; San Joaquin County GIS. Map date: May 2, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

The purpose of this section is to provide a discussion of the archaeological background, ethnographic overview, historic overview, known cultural resources in the region, the regulatory setting, an impact analysis, and mitigation measures. This section is primarily based upon the *Cultural Resources Assessment for the Mossdale Landing West Project,* Peak & Associates, Inc., March 18, 2024; refer to as Appendix C.1, *Cultural Resources Assessment*.

One comment was received during the public review period or scoping meeting for the Notice of Preparation (NOP) regarding this topic from the following: Native American Heritage Commission (NAHC) (March 25, 2024). This comment is addressed within this section. Full comments received are included in Appendix A.

3.5.1 ENVIRONMENTAL SETTING

PROJECT SETTING

The Project site is located in West Lathrop Specific Plan (WLSP) area in the City of Lathrop, San Joaquin County, California. The Project site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The Project site is comprised of the following parcels: 191-190-74, 191-190-75, 191-190-76, 191-190-77, 191-190-78, 191-340-03, 191-610-02, 191-610-22, 191-620-50, and 191-620-59. The majority of the Project site is currently undeveloped. The elevation of the project site is generally flat and ranges from approximately 14 feet to 21 feet above mean sea level (MSL).

CULTURAL AND HISTORICAL SETTING

Prehistory

The Windmiller Culture (Early Horizon) is characterized by ventrally-extended burials (some dorsal extensions are known), with westerly orientation of heads; a high percentage of burials with grave goods; frequent presence of red ocher in graves; large projectile points, of which 60 percent are of materials other than obsidian; rectangular *Haliotis* beads; *Olivella* shell beads (types A1a and L); rare use of bone; some use of baked clay objects; and well-fashioned charmstones, usually perforated.

The Cosumnes Culture (Middle Horizon) displays considerable changes from the preceding cultural expression. The burial mode is predominately flexed, with variable cardinal orientation and some cremations present. During the Middle Horizon, there is a lower percentage of burials with grave goods, and ocher staining is common in graves. *Olivella* beads of types C1, F and G predominate, and there is abundant use of green *Haliotis* sp. rather than red *Haliotis* sp. Other characteristic artifacts include perforated and canid teeth; asymmetrical and "fishtail" charmstones, usually unperforated; cobble mortars and evidence of wooden mortars; extensive use of bone for tools and ornaments; large projectile points, with considerable use of rock other than obsidian; and use of baked clay.

The Hotchkiss Culture (Late Horizon) burial pattern retains the use of the flexed mode. There is wide spread evidence of cremation, and lesser use of red ocher, heavy use of baked clay, *Olivella* beads of Types E and M, extensive use of *Haliotis* ornaments of many elaborate shapes and forms, shaped mortars and cylindrical pestles, bird-bone tubes with elaborate geometric designs, clam shell disc beads, small projectile points indicative of the introduction of the bow and arrow, flanged tubular pipes of steatite and schist, and use of magnesite. The characteristics noted are not all-inclusive, but cover the more important traits.

Ethnography

The Project site lies within the northern portion of the ethnographic territory of the Yokuts people. The Yokuts were members of the Penutian language family which held all of the Central Valley, San Francisco Bay Area, and the Pacific Coast from Marin County to near Point Sur. The Yokuts differed from other ethnographic groups in California as they had true tribal divisions with group names. Each tribe spoke a particular dialect, common to its members, but similar enough to other Yokuts that they were mutually intelligible.

The Yokuts held portions of the San Joaquin Valley from the Tehachapis in the south to Stockton in the north. On the north, they were bordered by the Plains Miwok, and on the west by the Saclan or Bay Miwok and Costonoan peoples. Although neighbors were often from distinct language families, differences between the people appear to have been more influenced by environmental factors as opposed to linguistic affinities. Thus, the Plains Miwok were more similar to the nearby Yokuts than to foothill members of their own language group. Similarities in cultural inventory co-varied with distance from other groups and proximity to culturally diverse people. The material culture of the southern San Joaquin Yokuts was therefore more closely related to that of their non-Yokuts neighbors than to that of Delta members of their own language group.

Trade was well developed with mutually beneficial interchange of needed or desired goods. Obsidian, rare in the San Joaquin Valley, was obtained by trade with Paiute and Shoshoni groups on the eastern side of the Sierra Nevada, where numerous sources of this material are located, and to some extent from the Napa Valley to the north. Shell beads, obtained by the Yokuts from coastal people, and acorns, rare in the Great Basin, were among many items exported to the east by Yokuts traders.

Economic subsistence was based on the acorn, with substantial dependency on gathering and processing of wild seeds and other vegetable foods. The rivers, streams, and sloughs that formed a maze within the valley provided abundant food resources such as fish, shellfish, and turtles. Game, wild fowl, and small mammals were trapped and hunted to provide protein augmentation of the diet. In general, the eastern portion of the San Joaquin Valley provided a lush environment of varied food resources, with the estimated large population centers reflecting this abundance.

Settlements were oriented along the water ways and village sites were normally placed adjacent to these features for their nearby water and food resources. House structures varied in size and shape, with most constructed from the readily available tules, a giant species of sedge, found in the extensive marshes of the low-lying valley areas. The housepit depressions for the structures ranged in diameter from three to 18 meters.

Regional Historical Background

The northern section of the City of Lathrop lies on a portion of the Rancho Campo de los Franceses, the ranch named for the early camp first occupied by French-Canadian trappers employed by the Hudson's Bay Company in 1832. The site of the present-day location of French Camp was the terminus of the Oregon Trail used by the trappers between 1832 and 1845. In 1843, William Gulnac, likely one of the trappers who had become a Mexican citizen, with Charles Weber, later founder of Stockton, organized a company of 12 men for the purpose of forming a colony at French Camp. Gulnac filed for a land grant, and was awarded a large tract of land including French Camp and the later site of Stockton by the Mexican government.

Much of the remainder of the land is a portion of the El Pescadero land grant. The Mexican land grant of 35,546 acres, lying in portions of what is now San Joaquin and Alameda counties, was awarded in 1843 to Antonio Maria Pico. Pico sold one half of the property to Henry Morris Naglee in 1849. Pico sold one half of the remainder of the property in 1852 to John C. Frémont. After California became a state, a claim was filed for the grant in 1852 and rejected in 1854, but ultimately the land grant was patented to Pico and Naglee in 1865. The land grant was settled by numerous squatters, and Fremont sold his land to Charles McLaughlin in 1867.

Before becoming an incorporated city, Lathrop was the location of a station on the Central Pacific, established in 1869 when the last stretch of the transcontinental railroad was built from Sacramento through this region, crossing the San Joaquin River at Mossdale to reach the Bay Area.

The site of Lathrop was first known as Wilson's Station, and included a store and a schoolhouse on land belonging to Thomas A. Wilson. Due to conflicts in the City of Stockton that infuriated Leland Stanford, the Central Pacific Railroad switched many operations to Wilson's Station, later re-named for Charles Lathrop, brother-in-law of Leland Stanford. The town drew significant commerce away from the City of Stockton. The railroad's machine shops and roundhouse were built here, and the town became an important division point and major stop on the railroad line beginning in 1871. Lathrop became an important shipping point for agricultural products.

The early major building in Lathrop was the 1871 Central Pacific Railroad restaurant, serving passengers from trains from the Bay Area to Sacramento, and passengers travelling to the San Joaquin Valley. After he physically struck United States Supreme Court Justice Stephen Field in 1889 in the Central Pacific restaurant, attorney David S. Terry was shot and killed by Field's bodyguard.

Lathrop remained important for the railroads, and in 1890, had about 500 residents. Daily, there were 12 passenger and 44 freight trains passing through. But that changed in the early 1890s with the growth of Tracy, and the transfer of the machine shop and roundhouse to that community. The completion of the Western Pacific railroad in 1909 did not affect the town, with the local station located approximately 0.75 miles from the town.

In 1942, the Lathrop Holding and Reconsignment Point was established in the Lathrop vicinity on what had been a sheep ranch, holding supplies for shipment through Bay Area ports. As many as 450 railroad cars would be loaded and unloaded each day.

The facility has gone through many changes with the changing needs of the military during times of conflict. After the end of World War II, the depot went through administrative and supply mission changes, the government applied a new name in 1948: Sharpe General Depot. The conflict in Korea brought a demand for increased services as the staffing, shipments and missions doubled during the three years of the war. The Army curtailed supply operations, and the Sharpe site began providing medical supplies and subsistence items on a larger scale. In 1962, the facility became the Sharpe Army Depot.

In 1965, with the escalation of the war in Vietnam, Sharpe became the major conduit for supplies moving to Southeast Asia. The Sharpe facility has continued to operate with a large part of the staffing switched to the Tracy facility beginning in 1999.

In the 1950s, several industrial plants were built in the Lathrop area, providing additional employment in the region. Beginning in the 1980s, improvements to community infrastructure and the attractive pricing of homes brought even more growth. The pattern of rapid growth continues to this day, with industrial and commercial development in the area, as well as many residents commuting daily to the Bay Area. The City of Lathrop incorporated in 1989.

PROJECT SITE HISTORY

The earliest settlement of the Plan Area appears to have been by Jacob Wright Harlan, who arrived in the region in September 1853 after driving cattle for Omaha. Harlan built a house and established an orchard. Shortly after this, Harlan traded his land claim with Garnet and another man, giving them $2,500 in cattle, with the two men also conveying to Harlan the undivided one-half interest in the Slocum Ferry. By 1888, when Harlan wrote about his experiences, he said by that date, it was named Johnson's Ferry. For Harlan, the ferry was paying well, so in 1856, bought the other one-half interest in the ferry. Part of one of the deals included an eight-room two-story house. Harlan ran the ferry for three more years, then sold the San Joaquin property to B.F.M. Packard and J. Saynor for $11,000. The 1860 federal census shows Benjamin Packard employed as a "ferryman."

Two years later, William B. Johnson bought the ferry, and his name retained for it until recent years. William B. Johnson, who eventually owned virtually all the lands of the Plan Area. He chose to have a biography printed in the 1890 County History, so much is known about his life.

Johnson was born in 1812 in Kentucky, and in 1830, he went to Louisiana. A year later he went to Missouri and continued working in agriculture until the lure of gold took him to California in 1849. He mined in the Mariposa region, then went to mine at Washington Flats on the Merced region. After making $1200, he went back east to buy cattle through Nicaragua. He remained in the east for a year, but eventually picked up a drove of 500 cattle, bringing them to San Joaquin County. In the spring of 1852, he and his partner again went east and brought another drove of cattle. Johnson also brought cattle from Los Angeles, becoming very successful. He continued to engage in the cattle trade. He bought an initial tract of land consisting of between 600 and 700 acres in 1862, where he built his home. He added more land to the ranch, and by 1890, had a tract of 1440 acres along the San Joaquin River, with other lands to the north, a ranch of 1,440 acres. In 1889 he sold a tract of land on Union Island of 317 acres. He also owned 3,500 acres of land in Fresno County, part in cultivation and part used for grazing.

Johnson's land had a house on it when he purchased the land; the frame of which had been brought to California around Cape Horn in about 1850. This must be the home for the various early owners. Johnson added to the existing house, and the early house remained part of the complex. His house appears to have been located on the south side of Johnson Ferry Road, in the vicinity of the location of the Silveira residence, comparing the 1879 mapped location with the location of the site recorded with the 1920s building.

Johnson had not only a huge acreage of land, but also had other properties including some business blocks in the city of Stockton and was a stockholder in the San Joaquin Valley Bank. Johnson never married, but in 1874, he adopted a five-year-old girl, Mary Eliza Strahn. Johnson's Ferry seems to have been a more minor part of Johnson's enterprises. River Island Parkway follows the route of Johnson's Ferry Road. Johnson acquired the Slocum Ferry that crossed the San Joaquin River at the crossing of the River Island Parkway bridge. Johnson maintained the ferry from 1865, or possibly earlier to at least the mid-1870s. Moss had a ferry crossing at Mossdale, and the two men made several deals with Moss promising to stop his ferry business for a fee.

The adopted daughter was married in 1888 to Martin Howell. After the death of Johnson in January 1891, she was the only heir to a million-dollar estate. There were numerous legal issues, including the inability to find the will, and some questioning the validity of the adoption. In 1895, the property including the Plan Area was shown as owned by Budd, Nutter, and Johnson. In 1911, the land was owned by the Stockton Savings Bank.

In about 1920, a 230-acre tract of land was acquired by Joaquin Silveira, a banker from Oakland. His hobby was dairy ranching. The family stayed at the ranch on occasion. The existing large white building was reportedly completed in 1929. In 2006, his son owned the property, and provided information on the Silveira family to Vicki Beard.

METHODOLOGY

Records Search

A record search was conducted for the Area of Potential Effect (APE) and a 0.25-mile radius at the Central California Information Center (CCIC) of the California Historical Resources Information System on August 8, 2022, as shown in Appendix 2 of the Cultural Resources Assessment (Appendix C.1 of this EIR). Portions of the Project site have been surveyed in the past, first by Origer and Associates in 2007. Four sites are reported within the Project site: two isolated prehistoric period artifacts (P-39-004345 and P-39-004347), one isolated historic period glass fragment (P-39-004346), and the 1929 Silveira residential complex (P-39-004602).

The building complex, P-39-004602, was evaluated as not eligible for the National Register, first by Beard and followed by Section 106 consensus. This action is followed by a survey by AECOM of the area along the RD 17 levee with apparently no further sites found. GEI Consultants Inc. monitored the levee construction work. No archeological resources were found, nor was a report prepared to document the monitoring effort.

Field Assessment

Peak & Associates completed a field survey of a portion of the Plan Area on September 14, 2022. The Reclamation District (RD) 17 levee work was underway during the site visit. The construction yard for the levee work had been set up within the boundaries of P-39-0004602. The Plan Area was under cultivation for tomatoes.

The survey area is mostly leveled agricultural fields protected from the adjacent San Joaquin River to the south, west and north by an 18 feet tall earthen levee. Subdivisions are located adjacent to the northern and eastern boundaries.

River Island Parkway runs adjacent to the east boundary with an over-crossing at the southeast section. The location of the former historical Johnson's Ferry is at this point and comprises the southeastern tip of the survey area. Several older buildings remain, including two barns, a two-story house, and a shed (recorded as P-39-004602).

At time of the initial survey effort, a major levee improvement project for RD 17 was underway, with heavy equipment removing soil from levee, reinforcing the base, and then importing more soil to raise the elevation. The toe of the levee appeared to be widened, extending slightly into the farm complex and possibly the field area as well. Construction equipment as well as a contractor trailer and storage units were present near the two-story house. The levee work had been completed before the final field effort in 2023.

The sediments within the agricultural area are primarily silty loam, light brown in color, uniformly distributed across all fields. There is a modest content of rounded alluvial pebbles likely associated with the adjacent river. Areas excavated to a depth of up to two feet for irrigation placement revealed the same soil constituents and color.

The soil of the farm building complex is light to medium brown sandy to silty loam with rounded alluvial pebbles and imported road gravel, cobbles. Around barns and likely locations of animal pens, the soil is slightly more organic and darker in color and with a higher fraction of compaction and disturbance.

The first survey effort was minimal after finding the levee work underway and a tomato crop still growing over much of the land acreage. The survey efforts were conducted after the fall crop harvest and the fields were mostly bare, tilled and fallow. Typical invasive and indigenous weeds and plants such as wild radish, datura, goats-head, brome and Russian thistle were present around the perimeter of the fiends and along edges of dirt access roads. Native valley oaks were present in several places at property boundaries and near the farm complex. Ornamental imported trees stand near the barns and house.

The ground visibility was excellent in both agricultural fields and within the farm complex due to seasonal harvest and tilling, and scraping for levee toe construction.

Due to known historical and prehistoric occupation within or nearby the Project site, complete intensive investigation was conducted using parallel transects not greater in width than three to five meters within the entire building complex segment and within 100 feet of the levee in the crop fields. For the remainder of the fields general survey method of parallel transects no greater than 10 to 15 meters in width was used.

No cultural resources were observed within the crop field sections, and within farm building complex site area, less than ten fragments of historical refuse were identified including green glass, aqua glass, window glass, baling wire and one small cut nail.

Native American Consultation

The NAHC responded to a Sacred Land File (SLF) request for the Project site on October 12, 2022, which resulted in positive results. The NAHC provided a list of individuals and groups to contact regarding potential cultural resources within the Project site. Letters were sent to the groups and individuals listed on December 13, 2023. Pursuant to the SB 18 tribal consultation requirements, the City received responses from Wilton Rancheria and Confederated Villages of Lisjan. The Confederated Villages of Lisjan requested a copy of the records search and to be included on notifications for the Project. The City provided a response to the tribe. The Wilton Rancheria requested consultation, and a meeting was held on January 30, 2024. During consultation, the Wilton Rancheria stated that the tribe’s internal records show that the Project site is located within a sensitive area, referencing an internal map that shows records of three tribal resources and one historic resource. The Wilton Rancheria recommended that the tribe be part of the site survey for the Cultural Study by Peak & Associates and referenced that the tribe does on-site tribal monitoring and Cultural Sensitivity Training (discussions with construction staff) prior to construction. The consultation was concluded on January 30, 2024. Refer to Appendix C.2 of this EIR for tribal consultation correspondence.

The City conducted Native American consultations under Senate Bill (SB) 18 (Chapter 905, Statutes of 2004), which requires local governments to consult with tribes prior to making certain planning decisions and requires consultation and notice for a general and specific plan adoption or amendments in order to preserve, or mitigate impacts to, cultural places that may be affected. In addition to Senate Bill (SB) 18 consultation, the City conducted tribal consultations under the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e)), also known as Assembly Bill (AB) 52, which requires consulting for projects within the City’s jurisdiction and within the traditional territory of the Tribal Organizations who have previously requested AB 52 consultations with the City.

3.5.2 REGULATORY SETTING

FEDERAL

National Historic Preservation Act

The National Historic Preservation Act was enacted in 1966 as a means to protect cultural resources that are eligible to be listed on the National Register of Historic Places (NRHP). The law sets forth criterion that is used to evaluate the eligibility of cultural resources. The NRHP is composed of districts, sites, buildings, structures, objects, architecture, archaeology, engineering, and culture that are significant to American History.

Virtually any physical evidence of past human activity can be considered a cultural resource. Although not all such resources are considered to be significant and eligible for listing, they often provide the only means of reconstructing the human history of a given site or region, particularly where there is no written history of that area or that period. Consequently, their significance is judged largely in terms of their historical or archaeological interpretive values. Along with research values, cultural resources can be significant, in part, for their aesthetic, educational, cultural and religious values. Neither the City of Lathrop nor agency regional or state agencies are required to comply with the National Historic Preservation Act, which governs the actions of federal agencies such as the United States Army Corps of Engineers when it engages in wetland permitting.

National Register of Historic Places

The eligibility criteria for the NRHP are as follows (36 CFR 60.4):

> *The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and*
>
> *(A) that are associated with events that have made a significant contribution to the broad patterns of our history and cultural heritage; or*
> *(B) that are associated with the lives of persons significant in our past; or*
> *(C) that embody the distinctive characteristics of a type, period, region, or method of construction, or that represent the work of a master, or that possess high artistic values or that represent a significant and distinguishable entity whose components may lack individual distinction; or*
> *(D) that have yielded, or may be likely to yield, information important in prehistory or history.*

STATE

California Register of Historic Resources

The California Register of Historical Resources (CRHR) was established in 1992 and codified in the Public Resource Code Sections 5020, 5024 and 21085. The law creates several categories of properties that may be eligible for the CRHR. Certain properties are included in the program automatically, including: properties listed in the NRHP; properties eligible for listing in the NRHP; and certain classes of State Historical Landmarks. Determining the CRHR eligibility of historic and prehistoric properties is guided by Section 15064.5(b) of the CEQA Guidelines and Public Resources Code (PRC) Sections 21083.2 and 21084.1.

Historical resources, under CRHR guidelines, are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, or scientific importance. A cultural resource may be eligible for listing on the CRHR if it:

a) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
b) is associated with the lives of persons important in our past;
c) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual or possesses high artistic values; or
d) has yielded, or may be likely to yield, information important in prehistory or history.

California Environmental Quality Act

CEQA requires that lead agencies determine whether projects may have a significant effect on three categories of distinct but sometimes overlapping cultural resources: "unique archaeological resources," "historical resources," and "tribal cultural resources." The determination as to whether a particular cultural resource falls under one of these three categories requires the application of statutory criteria set forth in Public Resources Code sections 21083.2[g] (unique archaeological resources), 21084.1 (historical resources), and 21074 (tribal cultural resources), Further guidance regarding the first categories is also found in CEQA Guidelines section 15064.5.

If the agency determines that a project may cause a substantial adverse change in the significance of either an historical resource or a tribal cultural resource, then the project may have a significant environmental effect and an EIR is required for the project. (Pub. Resource Code, §§ 21084.1, 210842.) If a cultural resource is found not to be significant under the qualifying criteria for these three statutory categories of cultural resources, then then the cultural resource need not be considered further in the planning process. Notably, the Legislature has directed that "[a]n [EIR], if otherwise necessary, shall not address the issue of nonunique archaeological resources. A negative declaration shall be issued with respect to a project if, but for the issue of nonunique archaeological resources, the negative declaration would be otherwise issued." (Pub. Resources Code, § 21083.2, subd. (a).)

CEQA emphasizes avoidance of unique archaeological resources and historical resources as the preferred means of reducing potential significant environmental effects resulting from projects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to mitigate the impacts. In order to adequately address the level of potential impacts, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. The following are steps typically taken to assess and mitigate potential impacts to unique archaeological resources and historical resources for the purposes of CEQA:

- Identify cultural resources,
- Evaluate the significance of the cultural resources found,
- Evaluate the effects of the project on cultural resources, and
- Develop and implement measures to mitigate the effects of the project on cultural resources that would be significantly affected.

HISTORICAL RESOURCES

"Historical resource" is a term with a defined statutory meaning (PRC, Section 21084.1; State CEQA Guidelines, Sections 15064.5[a] and [b]). Under State CEQA Guidelines Section 15064.5(a), historical resources include the following (with qualifications explained below):

1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (PRC, Section 5024.1).

2) A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, will be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource will be considered by the lead agency to be historically significant if the resource meets the criteria for listing in the California Register of Historical Resources (Public Resources Code, Section 5024.1), including the following:

    a) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

    b) Is associated with the lives of persons important in our past;

    c) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

d) Has yielded, or may be likely to yield, information important in prehistory or history.

4) The fact that a resource is not listed in or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to Section 5020.1(k) of the Public Resources Code), or identified in a historical resources survey (meeting the criteria in Section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in PRC Section 5020.1(j) or 5024.1.

UNIQUE ARCHAEOLOGICAL RESOURCES

CEQA also requires lead agencies to consider whether projects will impact unique archaeological resources. Public Resources Code Section 21083.2, subdivision (g), states that unique archaeological resource means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

TRIBAL CULTURAL RESOURCES (AB 52)

CEQA also requires lead agencies to consider whether projects will impact tribal cultural resources. AB 52, approved in September 2014, creates a formal role for California Native American tribes by creating a formal consultation process and establishing that a substantial adverse change to a tribal cultural resource has a significant effect on the environment. Public Resources Code Section 21074 states the following:

a) "Tribal cultural resources" are either of the following:

1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.

B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

b) A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

AB 52 requires a lead agency, prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report for a project, to begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project if: (1) the California Native American tribe requested to the lead agency, in writing, to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe, and (2) the California Native American tribe responds, in writing, within 30 days of receipt of the formal notification, and requests the consultation.

No California Native American tribes have requested consultation with the City of Lathrop pursuant to AB 52.

NATIVE AMERICAN REMAINS

CEQA also provides for the protection of Native American human remains (CCR §15064.5[d]). Native American human remains are also protected under the Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001 et seq.), which requires federal agencies and certain recipients of federal funds to document Native American human remains and cultural items within their collections, notify Native American groups of their holdings, and provide an opportunity for repatriation of these materials. This act also requires plans for dealing with potential future collections of Native American human remains and associated funerary objects, sacred objects, and objects of cultural patrimony that might be uncovered as a result of development projects overseen or funded by the federal government.

Assembly Bill 978

In 2001, Assembly Bill (AB) 978 expanded the reach of Native American Graves Protection and Repatriation Act of 1990 and established a state commission with statutory powers to assure that federal and state laws regarding the repatriation of Native American human remains and items of patrimony are fully complied with. In addition, AB 978 also included non-federally recognized tribes for repatriation.

LOCAL

City of Lathrop General Plan

The City of Lathrop General Plan includes the following goals and policies to protect cultural, historic, and tribal resources:

POLICY: PUBLIC FACILITIES AND SERVICES ELEMENT

- PFS-1.10: Impact on Resources. Require new utility infrastructure to avoid sensitive natural and cultural resources to the greatest extent feasible.

GOAL: RECREATION AND RESOURCES ELEMENT

- RR-3: Preserve and protect prehistoric, historic, archaeological, and paleontological resources, to bolster community identity and protect sensitive resources.

POLICIES: RECREATION AND RESOURCES ELEMENT

- RR-3.1: Preservation. Protect areas containing significant historic, archaeological, and paleontological resources, as defined by the California Public Resources Code.
- RR-3.2: San Joaquin County Coordination. Coordinate with San Joaquin County to preserve local historic resources, conserve historical assets within the City, and allow for local community events to occur at these special locations.
- RR-3.3: Human Remains. Ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.
- RR-3.4: Tribal Consultation. Consult with Native American tribes that may be impacted by proposed development, as necessary, and in accordance with state, local, and tribal intergovernmental consultation requirements.

3.5.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed Project is considered to have a significant impact on cultural or tribal cultural resources if it will:

- Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5;
- Disturb any human remains, including those interred outside of formal cemeteries;
- Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

    - Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k);
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resources to a California Native American tribe.

IMPACTS AND MITIGATION MEASURES

Impact 3.5-1: Implementation of the proposed Project, with mitigation, would not cause a substantial adverse change to a significant historical resource, as defined in CEQA Guidelines §15064.5. (Less than Significant with Mitigation)

Portions of the Plan Area become the eastern half of a commercial ferry business in the early 1850s. An early house was also present in association in the Plan Area, that eventually become part of a larger home. The Cultural Resources Assessment concluded that there is potential for deposits in the Plan Area related to the later historic use of the Project site by William Johnson and successor owners.

The previously recorded building complex, P-39-004602, has been formally determined to be “not significant” by the State Office of Historic Preservation. It has been concluded by the State Office of Historic Preservation that the 1929 Silveira house and adjacent buildings themselves are not eligible for the National Register or California Register. Nevertheless, it is possible other sites are present on-site.

Although no historic resources are known to occur within the Project site, there is potential of discovery of previously unknown historic resources during ground-disturbing activities. This is a ***potentially significant*** impact.

MITIGATION MEASURE(S)

Mitigation Measure 3.5-1: *Prior to any ground-disturbing activities in the area of the Project site which may contain a prehistoric site (as shown in the confidential appendix included as part of the confidential version of the Cultural Resources Assessment for the Mossdale Landing West Project, Peak & Associates, Inc., March 18, 2024; refer to as Appendix C.1, Cultural Resources Assessment), the Project proponent shall develop and implement an Archaeological Monitoring Program, whereby the Project proponents shall retain the services of an experienced archaeologist who will be present on-site to observe ground-disturbing activities requiring grubbing, grading, trenching, or excavation in the area of the Project site which may contain a prehistoric site. The Archaeological Monitor will be given access to inspect all ground surface and subsurface modifications, excavations, installations, equipment parking, and any other construction-related activities on the area of the Project site which may contain a prehistoric site.*

The archaeological monitoring will consist of on-the-ground and close observation by an experienced archaeologist for any kind of archaeological or cultural remains that might be exposed during ground-disturbing construction activities. Construction activities in the area of the Project site which may contain a prehistoric site will be monitored by following the construction equipment as it removes or modifies soils and vegetation, and may involve walking cuts or excavations after the machinery has passed, or standing to the side and observing the soil removal activity. The archaeologist on-site will be given "stop work authority" so that in the event that they observe a change in soil conditions and/or artifacts or structural remains, they shall bring all construction activities within a 200-foot radius of the area to a stop so that they may further assess the find. Further ground disturbances in the vicinity of the find will remain stopped while an assessment is underway and until the archaeologist on-site can provide recommendations for treatment of the discovery. If a potentially significant find cannot be avoided by the Project, the retained archaeologist, who meets the Secretary of the Interior's Professional Qualifications Standards, will develop an evaluation plan in consultation with the City that contains a research design to guide assessments of the resource's significance and scientific potential.

Mitigation Measure 3.5-2: *Prior to any ground-disturbing activities on any portion of the Project site, a qualified archaeologist and native American monitor shall conduct pre-construction worker cultural resources sensitivity training. The training session shall focus on the recognition of the types of historical and cultural, including Native American, resources that could be encountered, procedures to be followed if resources are found, and pertinent laws protecting these resources. Those in attendance shall be recorded, with records maintained on-site. Any new workers that were not part of the initial training shall be required to undergo a new training session.*

SIGNIFICANCE AFTER MITIGATION

Less than Significant.

Implementation of Mitigation Measures 3.5-1 and 3.5-2 would reduce potential impacts of the proposed Project on inadvertently discovered historical resources to a less-than-significant level by ensuring that any resources inadvertently discovered during construction would be evaluated for significance and treated appropriately, as well conducting cultural resources sensitivity training for the construction workers so they can better recognize potential cultural resources.

Impact 3.5-2: Implementation of the proposed Project, with mitigation, would not cause a substantial adverse change to a significant cultural resource, as defined in CEQA Guidelines §15064.5. (Less than Significant with Mitigation)

The Project site is located in an area known to have archaeological, cultural, and tribal cultural resources. As noted previously, according to the records search results, no cultural resources have been reported within the Project site; however, several resources have been found within the vicinity of the Project site. Three prehistoric period artifacts were found in the vicinity of the Plan Area. Two isolated prehistoric period artifacts (P-39-004345 and P-39-004347), and one isolated historic period glass fragment (P-39-004346).

The southern portion of the Project site lies at the location of "Johnson's Ferry." There is clearly a higher point in the Project site that could have been a prehistoric period site. Although no historic site was found by former surveys, it is possible that historic period activities, including residential construction, may have covered the remnants of a prehistoric site. Water crossings throughout northern and central California are historically located on high spots, allowing a safe crossing for ferries and bridges. These high spots have proven to be the locations of prehistoric sites, at one or both ends of the bridge or ferry landings. In the Plan Area, there is a higher elevation that could be a prehistoric period site. There are no records of any findings when the bridge was installed for River Island Parkway and no prehistoric period resources were found within the boundaries of the Plan Area. However, there is potential that a site could exist and it is unknown. The findings of the Cultural Resources Assessment concluded the Project site possesses a possibility to contain previously unrecorded historic era cultural resources that are currently obscured by existing vegetation, fill, or other historic activities, leaving no surface evidence.

There is a possibility of discovery of previously unknown cultural resources during ground-disturbing activities. This is a ***potentially significant*** impact.

MITIGATION MEASURE(S)

*Implement **Mitigation Measures 3.5-1 and 3.5-2**.*

SIGNIFICANCE AFTER MITIGATION

Less than Significant.

Implementation of Mitigation Measures 3.5-1 and 3.5-2 would reduce potential impacts of the proposed Project on inadvertently discovered archaeological resources to a less-than-significant level by ensuring that any resources inadvertently discovered during construction would be evaluated for significance and treated appropriately, as well conducting cultural resources sensitivity training for the construction workers so they can better recognize potential cultural resources.

Impact 3.5-3: Project implementation would not disturb human remains, including those interred outside of formal cemeteries. (Less than Significant)

Indications suggest that humans have occupied San Joaquin County for over 10,000 years and it is not always possible to predict where human remains may occur outside of formal burials. Therefore, excavation and construction activities, regardless of depth, may yield human remains that may not be interred in marked, formal burials.

Under CEQA, human remains are protected under the definition of archaeological materials as being "any evidence of human activity." Public Resources Code Section 5097 has specific stop-work and notification procedures to follow in the event that human remains are inadvertently discovered during Project implementation.

No human remains are documented on or near the Project site. Compliance with the existing regulatory environment would ensure that all construction activities which inadvertently discover human remains implement State-required consultation methods to determine the disposition and historical significance of any discovered human remains, which would ensure impacts are ***less than significant***.

MITIGATION MEASURE(S)

None required.

Impact 3.5-4: Implementation of the proposed Project, with mitigation, would not cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074. (Less than Significant with Mitigation)

Prehistoric archaeological sites and isolates are tribal cultural resources; additionally, plants and other natural resources, as well as geographic locations can also be tribal cultural resources. Grading of original in situ soils could expose buried tribal cultural resources and features including sacred sites. Redevelopment and development of previously undeveloped areas have the potential to impact known and unknown tribal cultural and archaeological resources. Surface-level and subsurface archaeological sites and deposits can be affected by ground-disturbing activities associated with construction activities.

The Cultural Resource Assessment found no Native American sacred sites or human remains on the Project site. In accordance with requirements promulgated by SB 18 and AB 52, the City notified the Buena Vista Rancheria of Me-Wuk Indians, California Valley Miwok Tribe, Ione Band of Miwok Indians, Muwekma Ohlone Indian Tribe of the SF Bay Area, North Valley Yokuts Tribe, Tule River Indian Tribe, Wilton Rancheria, Wuksache Indian Tribe/Eshom Valley Band, and the Confederated Villages of Lisjan of the proposed Project on December 13, 2023, and invited the tribes to participate in consultation (see Appendix C.2). The City received responses from Wilton Rancheria and Confederated Villages of Lisjan. The Confederated Villages of Lisjan requested a copy of the records search and to be included on notifications for the Project. The City provided a response to the tribe. The Wilton Rancheria requested consultation, and a meeting was held on January 30, 2024. During consultation, the Wilton Rancheria stated that the tribe's internal records show that the Project site is located within a sensitive area, referencing an internal map that shows records of three tribal resources and one historic resource. The Wilton Rancheria recommended that the tribe be part of the site survey for the Cultural Study by Peak & Associates and referenced that the tribe does on-site tribal monitoring and Cultural Sensitivity Training (discussions with construction staff) prior to construction. The consultation was concluded on January 30, 2024.

Based on information in the Cultural Resources Assessment, there is a moderate to high potential of discovery of previously unknown tribal cultural resources during ground-disturbing activities. This is a ***potentially significant*** impact.

MITIGATION MEASURE(S)

Implement ***Mitigation Measures 3.5-1 and 3.5-2.***

Mitigation Measure 3.5-3: *Prior to any ground-disturbing activities in the area of the Project site which may contain a prehistoric site (as shown in the confidential appendix included as part of the confidential version of the Cultural Resources Assessment for the Mossdale Landing West Project, Peak & Associates, Inc., March 18, 2024; refer to as Appendix C.1, Cultural Resources Assessment), the Project proponent shall retain a Native American Monitor. The monitor shall be retained prior to the commencement of any "ground-disturbing activity" in the area of the Project site which may contain a prehistoric site. "Ground-disturbing activity" shall include, but is not limited to, demolition, pavement removal, potholing, auguring, grubbing, tree removal, boring, grading, excavation, drilling, and trenching. Upon discovery of any tribal cultural resources (TCRs), all construction activities in the immediate vicinity of the discovery shall cease (i.e., not less than the surrounding 50 feet) and shall not resume until the discovered TCR has been fully assessed by the Native American Monitor. The monitor shall recover and retain all discovered TCRs in the form and/or manner the Tribe deems appropriate, in the Tribe's sole discretion, and for any purpose the Tribe deems appropriate, including for educational, cultural and/or historic purposes.*

SIGNIFICANCE AFTER MITIGATION

Less than Significant

Implementation of Mitigation Measures 3.5-1, 3.5-2 and 3.5-3 would reduce potential impacts of the proposed Project on inadvertently discovered tribal cultural resources to a less-than-significant level by ensuring that any resources inadvertently discovered during construction would be evaluated for significance and treated appropriately, as well conducting cultural resources sensitivity training for the construction workers so they can better recognize potential cultural resources.

This section provides a background discussion of the seismic and geologic hazards found in the Plan Area and the regional vicinity. This section is organized with an environmental setting, regulatory setting, and impact analysis. This section is based in part on the *Draft Environmental Impact Report for the Lathrop General Plan Update* (City of Lathrop, 2022), the *City of Lathrop General Plan* (City of Lathrop, 2022), and the *Web Soil Survey* (U.S. Department of Agriculture, National Resource Conservation Service, 2024).

There were no comment letters received during the NOP comment period that specifically address geology and soils. Full comments received are included in Appendix A.

3.6.1 ENVIRONMENTAL SETTING

GEOLOGIC SETTING

Regional Setting

The Project site is located in the central portion of the Great Valley geomorphic province, an alluvial plain about 50 miles wide and 400 miles long.[1] The southern half of the Great Valley, which includes the City of Lathrop, is also referred to as the San Joaquin Valley. The valley is bounded by the Sierra Nevada on the east and the Coast Ranges on the west.[2] The San Joaquin River is located just north, west, and south of the Project site. This major river drains the Great Valley Province into the San Joaquin Delta to the north, ultimately discharging into the San Francisco Bay to the northwest.

The San Joaquin Valley is filled with thick Mesozoic to Cenozoic marine and non-marine sedimentary rock sequences that were deposited as much as 130 million years ago. Large alluvial fans have developed on each side of the valley. The larger and more gently sloping fans are on the east side of the valley, and overlie metamorphic and igneous basement rocks. These basement rocks are exposed in the Sierra Nevada foothills and consist of meta-sedimentary, volcanic, and granitic rocks.

Local Setting

The site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The elevation of the site is generally flat and ranges from approximately 14 feet to 21 feet above mean sea level.

The majority of the Project site is currently undeveloped and consists primarily of agricultural uses. There is a two-story single-family residential structure east of River Islands Parkway near the San

[1] California Department of Conservation, California Geological Survey, 2022. California Geomorphic Provinces, Note 36. December. Available: https://www.conservation.ca.gov/cgs/Documents/Publications/CGS-Notes/CGS-Note-36.pdf. Accessed: March 7, 2024.

[2] United States Geological Survey, 2024. California's Central Valley. Available: https://ca.water.usgs.gov/projects/central-valley/about-central-valley.html. Accessed: March 7, 2024.

Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

Soils

The Project site is underlain by Quaternary (Q) sedimentary rock deposits,[3] which is younger alluvium that consists of marine and nonmarine (continental) sedimentary rocks from the Pleistocene through Holocene Epochs that are composed of alluvium, lake, playa, and terrace deposits, both unconsolidated and semi-consolidated. This type is mostly nonmarine deposits but does include marine deposits near the coast. Review of available groundwater information provided by the California Department of Water Resources indicates that a monitored well approximately 0.25 miles north-northeast of the Project site has a well depth of 21 feet below the ground surface.[4]

A Custom Soil Survey was completed for the Development Area using the Natural Resources Conservation Service (NRCS) Web Soil Survey program. The NRCS soils map is provided in Figure 3.6-1. Table 3.6-1 identifies the type and range of soils found in the Project Area.

As shown in Table 3.6-1, the majority of soils within the Development Area consist of silty clay loam. Below is a brief description of prominent soils within the Development Area.[5]

TABLE 3.6-1: DEVELOPMENT AREA SOILS

UNIT SYMBOL	*NAME*	*ACRES IN DEVELOPMENT AREA*	*PERCENT OF TOTAL*
130	Columbia fine sandy loam, drained, 0 to 2 percent slopes, MLRA 17	0.3	0.2%
148	Dello clay loam, drained, 0 to 2 percent slopes, overwashed	19.9	11.9%
153	Egbert silty clay loam, partially drained, 0 to 2 percent slopes, MLRA 16	26.5	15.8%
197	Merritt silty clay loam, partially drained, 0 to 2 percent slopes	120.7	72.1%
	Total	**167.4**	**100%**

SOURCE: UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL RESOURCE CONSERVATION SERVICE, WEB SOIL SURVEY, 2024. AVAILABLE: HTTPS://WEBSOILSURVEY.NRCS.USDA.GOV/APP/WEBSOILSURVEY.ASPX. ACCESSED MARCH 11, 2024.

Columbia soil series. Columbia series consists of very deep, moderately well drained soils formed in alluvium from mixed sources. These soils are on flood plains and natural levees and have slopes of

[3] California Department of Conservation, 2024. Data Viewer: Quaternary Surficial Geology of Southern California. Available: https://maps.conservation.ca.gov/cgs/DataViewer/index.html. Accessed: March 10, 2024.

[4] California Department of Water Resources, 2024. SGMA Data Viewer. Available: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#currentconditions. Accessed: March 23, 2024.

[5] United States Department of Agriculture, National Resource Conservation Service, Official Soils Series Descriptions, 2024. Available: https://soilseries.sc.egov.usda.gov/osdname.aspx. Accessed March 11, 2024.

0 to 8 percent. Drainage and permeability characteristics include moderately well drained; negligible to medium runoff; moderately rapid permeability.

Dello soil series. The Dello series consist of very deep, very poorly drained soils that formed in alluvium from granitic rock sources. Dello soils are in small depressions and have slopes of 0 to 2 percent. Drainage and permeability characteristics include very poorly drained; slow runoff; rapid permeability.

Egbert soil series. The Egbert series consists of very deep, poorly drained soils formed in alluvium from mixed sources. Egbert soils are in basins of river deltas and have slopes of 0 to 5 percent. Drainage and permeability characteristics include poorly drained; very slow or slow runoff; slow permeability (sandy substratum phase has rapid permeability below a depth of 40 inches).

Merritt soil series. The Merritt series consists of very deep, poorly drained soils formed in alluvium from sedimentary rocks. Merritt soils are on recent alluvial fans and flood plains and have slopes of 0 to 2 percent. Drainage and permeability characteristics include poorly drained; slow runoff; moderately slow permeability.

SOIL HAZARDS

Erosion

Erosion refers to a process of wearing away of the land surface (e.g., rocks, soil) by running water, waves, or moving ice and wind, or by such processes as mass wasting and corrosion.[6] Two common types of soil erosion include wind erosion and water erosion. Erosion potential in soils is influenced by several factors, including rainfall intensity, steepness and length of slope, vegetative cover, and management practices.[7] Loose soils can be eroded by water or wind forces, whereas soils with high clay content are generally susceptible to water erosion. The potential for erosion generally increases because of human activity, such as through the development and the removal of vegetative cover.

The Custom Soil Survey identified the erosion potential for the soils in the Project site. This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. Soil property data for each map unit component includes the hydrologic soil group, erosion factors "Kf" for the surface horizon, erosion factor "T", and the representative percentage of sand, silt, and clay in the surface horizon.

[6] United States Department of Agriculture, Natural Resources Conservation Service, 2024. National Soil Survey Handbook. Available: https://directives.sc.egov.usda.gov/49659.wba. Accessed: March 10, 2024.
[7] University of California, 2006. Publication 8194, Erodibility of Agricultural Soils. Available: https://anrcatalog.ucanr.edu/pdf/8194.pdf. Accessed: March 10, 2024.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water.[8] Values of "K" range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Within the Project site, the erosion factor "Kf" exhibits a wide range, varying from 0.20 to 0.37, which is considered a low to moderate potential for erosion. Furthermore, because the Development Area is essentially flat, the erosion potential is slight.

Expansive Soils

Expansive soils can undergo significant volume change with changes in moisture content. In general, expansive soils shrink and harden when dried, and swell and soften when wet. Such changes can cause distress to building foundations and structures, slabs on grade, pavements, and other surface improvements.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state.[9] Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than three percent; moderate if three to six percent; high if six to nine percent; and very high if more than nine percent. If the linear extensibility is more than three, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots; special design commonly is needed.

According to the Lathrop General Plan EIR, the soils in Project site generally have a low to moderate shrink-swell potential.[10]

Landslides

The California Geological Survey classifies landslides based on the type of material that failed and the type of movement that the failed material exhibited.[11] Material types are broadly categorized as either rock or soil, or a combination of the two for complex movements. Landslide movements are categorized as falls, topples, spreads, slides, or flows. Landslide potential is influenced by physical factors, such as slope, soil, vegetation, and precipitation. Landslides require a slope, and can occur naturally from seismic activity, excessive saturation, and wildfires, or from human-made conditions such as construction disturbance, vegetation removal, or wildfires.

As previously stated, the Development Area is essentially flat and ranges from approximately 14 feet to 21 feet above mean sea level; therefore, the potential for a landslide is low.

---

[8] United States Department of Agriculture, National Resource Conservation Service, 2024. Web Soil Survey. Available: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed: March 10, 2024.
[9] United States Department of Agriculture, Natural Resources Conservation Service, 2024. National Soil Survey Handbook. Available: https://directives.sc.egov.usda.gov/49659.wba. Accessed: March 10, 2024.
[10] De Novo Planning Group, 2022. Final Environmental Impact Report for the Lathrop General Plan Update. August. Figure 3.6-4.
[11] California Department of Conservation, California Geological Survey, 2024. Landslides. Available: https://www.conservation.ca.gov/cgs/landslides. Accessed: March 10, 2024.

Collapsible Soils

Collapsible soils are defined as any unsaturated soil that goes through a radical rearrangement of particles and greatly decreases in volume upon wetting, additional loading, or both.[12] These soils are typically found in arid or semiarid regions and have a loose soil structure and a water content far less than saturation. Four conditions are necessary for soil collapse to occur: an open, partially unstable, partially saturated fabric; sufficient total stress to make the soil structure metastable; presence of a bonding agent or sufficient soil suction to stabilize the soil in the metastable condition; and the addition of water, which reduces soil suction, or softens/destroys the bonding agent, thereby causing shear failures at the inter-aggregate or inter-particle contacts.[13] Examples of common problems associated with collapsible soils include tilting floors, cracking or separation in structures, sagging floors, and nonfunctional windows and doors.

Collapsible soils have not been identified in the Lathrop General Plan EIR as an issue in the Lathrop area.[14] However, in areas subject to potential liquefaction, the potential for liquefaction induced settlement is present.

Subsidence

Land subsidence is a gradual settling or sudden sinking of the Earth's surface due to removal or displacement of subsurface earth materials.[15] Common causes of land subsidence include: aquifer-system compaction associated with groundwater withdrawals; drainage of organic soils; underground mining; and natural compaction or collapse. Subsidence takes place gradually, usually over a period of several years.

Subsidence has not been identified in the Lathrop General Plan EIR as an issue in the Lathrop area.[16]

FAULTS AND SEISMICITY

Seismic hazards include both rupture (surface and subsurface) along active faults and ground shaking, which can occur over wider areas. Ground shaking, produced by various tectonic phenomena, is the principal source of seismic hazards in areas devoid of active faults. All areas of the state are subject to some level of seismic ground shaking.

---

[12] United States Bureau of Reclamation (Knodel, Paul C.), 1992. Characteristics and Problems of Collapsible Soils. Available: https://www.usbr.gov/tsc/techreferences/rec/R9202.pdf. Accessed: March 10, 2024.

[13] California Department of Transportation, 2024. Geotechnical Manual, Collapsable Soil. February. Available: https://dot.ca.gov/-/media/dot-media/programs/engineering/documents/geotechnical-services/202402-gm-collapsiblesoil-a11y.pdf. Accessed: March 10, 2024.

[14] De Novo Planning Group, 2022. Final Environmental Impact Report for the Lathrop General Plan Update. August.

[15] United States Geological Survey, 2024. Land Subsidence. Available: https://www.usgs.gov/mission-areas/water-resources/science/land-subsidence#overview. Accessed: March 10, 2024.

[16] De Novo Planning Group, 2022. Final Environmental Impact Report for the Lathrop General Plan Update. August.

Faults

Faults are defined as tectonic fractures or breaks in the earth's crust along which displacement (horizontal, vertical, or diagonal movement) has taken place.[17] Movement between these plates may occur rapidly, in the form of an earthquake, or may occur slowly, in the form of creep.[18] During an earthquake, the rock on one side of the fault suddenly slips with respect to the other.

Faults are classified as Historic, Holocene, Late Quaternary, Quaternary, and Pre-Quaternary according to the age of most recent movement.[19] These classifications are described as follows:

- **Historic:** faults on which surface displacement has occurred within the past 200 years;
- **Holocene:** shows evidence of fault displacement within the past 11,000 years, but without historic record;
- **Late Quaternary:** shows evidence of fault displacement within the past 700,000 years, but may be younger due to a lack of overlying deposits that enable more accurate age estimates;
- **Quaternary:** shows evidence of displacement sometime during the past 1.6 million years; and
- **Pre-Quaternary:** without recognized displacement during the past 1.6 million years.

Faults are further distinguished as active, potentially active, or inactive.[20]

- **Active:** An active fault is a Historic or Holocene fault that has had surface displacement within the last 11,000 years;
- **Potentially Active:** A potentially active fault is a pre-Holocene Quaternary fault that has evidence of surface displacement between about 1.6 million and 11,000 years ago; and
- **Inactive:** An inactive fault is a pre-Quaternary fault that does not have evidence of surface displacement within the past 1.6 million years. The probability of fault rupture is considered low; however, this classification does not mean that inactive faults cannot, or will not, rupture.

---

[17] California Department of Conservation (Jennings, C. & Bryant, W.), 2010. California Geological Survey An Explanatory Text to Accompany the Fault Activity Map of California. Available: https://www.conservation.ca.gov/cgs/Documents/Melange/FAM_phamplet.pdf. Accessed: March 7, 2024.

[18] United States Geological Survey, 2024. What is a fault and what are the different types? Available: https://www.usgs.gov/faqs/what-a-fault-and-what-are-different-types. Accessed: March 7, 2024.

[19] California Department of Conservation (Jennings, C. & Bryant, W.), 2010. California Geological Survey An Explanatory Text to Accompany the Fault Activity Map of California. Available: https://www.conservation.ca.gov/cgs/Documents/Melange/FAM_phamplet.pdf. Accessed: March 7, 2024.

[20] California Department of Conservation (Jennings, C. & Bryant, W.), 2010. California Geological Survey An Explanatory Text to Accompany the Fault Activity Map of California. Available: https://www.conservation.ca.gov/cgs/Documents/Melange/FAM_phamplet.pdf. Accessed: March 7, 2024.

One of the closest known faults to the Project site that is classified as active by the California Geological Survey is the Greenville fault, located approximately 23 miles to the west.[21] The Vernalis Fault, located approximately four miles to the southwest, has had movement as recently as the Quaternary Period, and is thus considered a potentially active fault. Other faults that could potentially affect the Project site include the Mount Diablo Thrust, Calaveras, Hayward, Ortigalita, and San Andreas Faults. Figure 3.6-2 provides a map of known area faults in relation to the Project site.

Seismicity

Earthquakes are generally expressed in terms of intensity and magnitude. Several scales may be used to measure the strength or intensity of an earthquake.[22] Magnitude scales, like the moment magnitude (Mw), measure the size of the earthquake at its source. An earthquake event has a single magnitude; however, the degree of ground shaking that the earthquake causes varies from place to place based on distance, type of surface material, and other factors. Magnitude is expressed as a number. For example, a magnitude 5.3 is a moderate earthquake, and a 6.3 is a strong earthquake. Because of the logarithmic basis of the magnitude scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude as measured on a seismogram.

In contrast to magnitude, other scales describe earthquake intensity, which can vary depending on distance from earthquake epicenter and local characteristics. The Modified Mercalli Intensity Scale expresses earthquake intensity experienced at a particular location on a scale of increasing levels of intensity that range from imperceptible shaking to catastrophic destruction. It does not have a mathematical basis; instead, it is an arbitrary ranking based on observed effects. Table 3.6-2 represents the potential effects of an earthquake based on the Modified Mercalli Intensities.

TABLE 3.6-2: MODIFIED MERCALLI INTENSITIES AND EFFECTS

INTENSITY	*SHAKING*	*DESCRIPTION/DAMAGE*
I	Not felt	Not felt except by very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Vibrations similar to the passing of a truck.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like a heavy truck striking a building. Standing vehicles are rocked noticeably.

[21] California Department of Conservation, California Geological Survey, 2024. Fault Activity Map of California. Available: https://maps.conservation.ca.gov/cgs/fam/. Accessed: March 7, 2024.

[22] United States Geological Survey, 2024. Earthquake Magnitude, Energy Release, and Shaking Intensity. Available: https://www.usgs.gov/programs/earthquake-hazards/earthquake-magnitude-energy-release-and-shaking-intensity. Accessed: March 7, 2024.

INTENSITY	SHAKING	DESCRIPTION/DAMAGE
V	Moderate	Felt by nearly everyone; many awakened: Some dishes and windows are broken. Unstable objects are overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, and many are frightened. Some heavy furniture is moved; a few instances of fallen plaster occur. Damage is slight.
VII	Very strong	Damage is negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys are broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage is considerable in specially designed structures; well-designed frame structures are thrown out of plumb. Damage is great in substantial buildings, with partial collapse. Buildings are shifted off foundations.

SOURCE: UNITED STATES GEOLOGICAL SURVEY, 2024. THE MODIFIED MERCALLI INTENSITY SCALE. AVAILABLE: HTTPS://WWW.USGS.GOV/PROGRAMS/EARTHQUAKE-HAZARDS/MODIFIED-MERCALLI-INTENSITY-SCALE. ACCESSED: MARCH 7, 2024.

SEISMIC HAZARDS

Alquist-Priolo Special Study Zone

An active earthquake fault, per California's Alquist-Priolo Act, is one that has ruptured within the Holocene Epoch (about the last 11,000 years).[23] The Alquist-Priolo Act requires the State Geologist to delineate Earthquake Fault Zones along known Holocene-active faults in California. These Earthquake Fault Zones are identified in Special Publication 42 (SP42), which is updated as new fault data become available. The SP42 lists all counties and cities within California that are affected by designated Earthquake Fault Zones. The Fault Zones are delineated on maps within SP42 (Earthquake Fault Zone Maps).

As shown in Figure 3.6-2, the Project site is not within an Alquist-Priolo Special Study Zone.

Fault Rupture

Surface fault rupture is the result of fault movement that breaks to the surface of the earth either suddenly during earthquakes, or slowly due to a process known as fault creep, and is the result of tectonic movement that originates deep in the Earth.[24] Surface fault rupture poses a hazard to

[23] California Department of Conservation, California Geological Survey. 2018 (revised). Earthquake Fault Zones (Special Publication 42). Available: https://www.conservation.ca.gov/cgs/documents/publications/special-publications/SP_042-a11y.pdf. Accessed: March 7, 2024.

[24] California Department of Conservation, California Geological Survey. 2018 (revised). Earthquake Fault Zones (Special Publication 42). Available: https://www.conservation.ca.gov/cgs/documents/publications/special-publications/SP_042-a11y.pdf. Accessed: March 7, 2024.

structures and infrastructure because the displacement that occurs can severely damage buildings. Fault rupture almost always follows pre-existing faults, which are zones of weakness.[25] The Alquist-Priolo Fault Zoning Act requires active earthquake fault zones to be mapped and it provides special development considerations within these zones. It is important to note that the Alquist-Priolo Act only addresses the hazard of surface fault rupture for Holocene-active faults; Pre-Holocene faults may also have the potential to rupture but are not addressed by the Alquist-Priolo Act.

As shown in Figure 3.6-2, the Project site does not have surface expression of active faults and fault rupture is not anticipated.

Seismic Ground Shaking

The potential for seismic ground shaking in California is expected. As a result of the foreseeable seismicity in California, the State requires special design considerations for all structural improvements in accordance with the seismic design provisions in the California Building Code. These seismic design provisions require enhanced structural integrity based on several risk parameters. According to the County Local Hazard Mitigation Plan (LHMP), while the County has a history of seismic activity, the likelihood and magnitude of a significant incident are minimal.[26]

Liquefaction

Liquefaction, which is primarily associated with loose, saturated materials, is most common in areas of sand and silt or on reclaimed lands. Cohesion between the loose materials that comprise the soil may be jeopardized during seismic events and the ground will take on liquid properties. Thus, specific soil characteristics and seismic shaking must exist for liquefaction to be possible. Liquefaction typically requires a significant sudden decrease of shearing resistance in cohesionless soils and a sudden increase in water pressure, which is typically associated with an earthquake of high magnitude.

The California Geological Survey (CGS) has designated certain areas within California as potential liquefaction hazard zones. These mapped areas are considered at risk of liquefaction-related ground failure during a seismic event based upon mapped surficial deposits. The Project site is not currently mapped for potential liquefaction hazard by the CGS.[27]

The potential for liquefaction is highest when groundwater levels are high, and loose, fine, sandy soils occur at depths of less than 50 feet. According to the General Plan EIR, soil data suggests that the potential for liquefaction ranges from low to high within the General Plan Planning Area, given

[25] California Department of Conservation, California Geological Survey, 2023. CGS Note 54. Available: https://www.conservation.ca.gov/cgs/documents/publications/cgs-notes/CGS-Note-54-SoCal-Regulatory-Earthquake-Hazard-Zones-a11y.pdf. Accessed: March 7, 2024.

[26] San Joaquin County, 2023. San Joaquin County Local Hazard Mitigation Plan 2023. Page 38.

[27] California Department of Conservation, California Geological Survey, 2024. Earthquake Zones of Required Investigation. Available: https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed: March 7, 2024.

that many soils are high in sand and the water table is moderately high.[28] The General Plan EIR identifies areas along existing waterways, which would include the Project site, as having the greatest potential for liquefaction.

Lateral Spreading

Lateral spreading is a type of ground deformation that occurs when surface material extends or spreads on gentle slopes.[29] Ground shaking, especially when inducing liquefaction, may cause lateral spreading toward unsupported slopes. Oftentimes, lateral spreading is directly associated with areas of liquefaction. According to the Lathrop General Plan EIR, lateral spreading of soils has not been observed within the Lathrop area.[30]

Earthquake-Induced Landslides

Earthquake-Induced Landslide Zones Areas are areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required. The California Geological Survey Zones of Required Investigation map does not identify any seismically-induced landslide zones in the City or in the Project site.[31]

PALEONTOLOGICAL RESOURCES

Among the natural resources deserving conservation and preservation, and existing within the Planning Area, are the often-unseen records of past life buried in the sediments and rocks below the pavement, buildings, soils, and vegetation which now cover most of the area. These records – fossils and their geologic context – undoubtedly exist in large quantities below the surface in many areas in and near the City of Lathrop, and span millions of years in age of origin. Fossils constitute a non-renewable resource: Once lost or destroyed, the exact information they contained can never be reproduced.

Paleontology is the science that attempts to unravel the meaning of these fossils in terms of the organisms they represent, the ages and geographic distribution of those organisms, how they interacted in ancient ecosystems and responded to past climatic changes, and the changes through time of all of these aspects.

[28] De Novo Planning Group, 2022. Final Environmental Impact Report for the Lathrop General Plan Update. August.

[29] United States Geological Survey, 2024. Lateral Spread. Available: https://www.usgs.gov/media/images/lateral-spread. Accessed: March 7, 2024.

[30] De Novo Planning Group, 2022. Final Environmental Impact Report for the Lathrop General Plan Update. August.

[31] California Department of Conservation, California Geological Survey, 2024. Earthquake Zones of Required Investigation. Available: https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed: March 7, 2024.

The sensitivity of a given area or body of sediment with respect to paleontological resources is a function of both the potential for the existence of fossils and the predicted significance of any fossils which may be found there. The primary consideration in the determination of paleontological sensitivity of a given area, body of sediment, or rock formation is its potential to include fossils. Information that can contribute to assessment of this potential includes: 1) direct observation of fossils within the project area; 2) the existence of known fossil localities or documented absence of fossils in the same geologic unit (e.g., "Formation" or one of its subunits); 3) descriptive nature of sedimentary deposits (such as size of included particles or clasts, color, and bedding type) in the area of interest compared with those of similar deposits known elsewhere to favor or disfavor inclusion of fossils; and 4) interpretation of sediment details and known geologic history of the sedimentary body of interest in terms of the ancient environments in which they were deposited, followed by assessment of the favorability of those environments for the preservation of fossils.

The most general paleontological information can be obtained from geologic maps, but geologic cross sections (slices of the layer cake to view the third dimension) must be reviewed for each area in question. These usually accompany geologic maps or technical reports. Once it can be determined which formations may be present in the subsurface, the question of paleontological resources must be addressed. Even though a formation is known to contain fossils, they are not usually distributed uniformly throughout the many square miles the formation may cover. If the fossils were part of a bay environment when they died, perhaps a scattered layer of shells will be preserved over large areas. If on the other hand, a whale died in this bay, you might expect to find fossil whalebone only in one small area of less than a few hundred square feet. Other resources to be considered in the determination of paleontological potential are regional geologic reports, site records on file with paleontological repositories and site-specific field surveys.

Paleontologists consider all vertebrate fossils to be of significance. Fossils of other types are considered significant if they represent a new record, new species, an oldest occurring species, the most complete specimen of its kind, a rare species worldwide, or a species helpful in the dating of formations. However, even a previously designated low potential site may yield significant fossils.

Regional Paleontological Setting

SAN JOAQUIN VALLEY

The following summary of the geological evolution of San Joaquin County and the potential for paleontological resources is based on the San Joaquin County General Plan Draft EIR. During the Mesozoic Era (208–65 million years ago [mya]), the Sierra Nevada formed, but the region that would become the San Joaquin Valley lay several thousand feet below the surface of the Pacific Ocean. During the Late Cretaceous Period (75–65 mya), flowering plants, early dinosaurs, and the first birds and mammals appeared. The basic form of the Great Central Valley took shape during the Cenozoic period, first as islands, then as mountains. During the late Cenozoic Era (65–2 mya), the Sierra Nevada eroded to mere hills compared to their earlier appearance, the Coast Ranges rose, and the San Joaquin Valley began to form.

During the Paleocene Epoch (65–53 mya), dinosaurs became extinct and mammals gradually evolved as the dominant group of animal life. During the Eocene Epoch (53–39 mya), the western edges of the San Joaquin Valley rose above sea level. Sedimentation and tectonic uplift of geological formations continued until two million years ago. In the subsequent Oligocene Epoch (39–23 mya), sedimentation continued, and during the Miocene Epoch (23–5 mya) the Diablo Range was uplifted. The Pliocene Epoch (5–2 mya) was a time of tremendous uplift, and great quantities of sediment eroded from the nearby mountain ranges accumulated in the valley, eventually forming a deposit thousands of feet thick. In the Pleistocene Epoch (2 million to 10,000 years ago), the Sierra Nevada range was increasingly elevated and glaciated, resulting in the formation of spectacular features such as Yosemite Valley. During the Holocene Epoch (10,000 years ago to the present), the San Joaquin Valley was above sea level and achieved its present appearance, 466 miles long and 19 to 50 miles wide, enclosed by the Siskiyou, Sierra Nevada, Tehachapi, and Coast Ranges on the north, east, south, and west, respectively. The valley contained fresh water lakes and rivers attractive to herds of prehistoric grazing animals, including Columbian Mammoth, camel, bison, and native horse. The fossil remains of these creatures have been found in San Joaquin County and adjacent areas. The vast majority of paleontological specimens from San Joaquin County have been found in rock formations in the foothills of the Diablo Mountain Range. However, remains of extinct animals such as mammoth, could be found virtually anywhere in the county, especially along watercourses such as the San Joaquin River and its tributaries.

PLAN AREA

The Geologic Map of California (California Department of Conservation, California Geological Survey), identifies the generalized rock types in the Project site as Quaternary (Q) sedimentary rock deposits,[32] which is younger alluvium that consists of marine and nonmarine (continental) sedimentary rocks from the Pleistocene through Holocene Epochs that are composed of alluvium, lake, playa, and terrace deposits, both unconsolidated and semi-consolidated. This type is mostly nonmarine deposits but does include marine deposits near the coast.

As indicated in the Lathrop General Plan EIR, according to a records search of the University of California Museum of Paleontology (UCMP) Collections, 80 fossils have been found and recorded within San Joaquin County.[33] Over half of them are dated to the tertiary period, with quaternary being the second most frequent period. These are the first and second periods of the Cenozoic Era respectively, during which modern flora, apes, large mammals, and eventually humans developed. The majority of fossils found within the Lathrop area have been vertebrate in nature. These fossils

[32] California Department of Conservation, 2024. Data Viewer: Quaternary Surficial Geology of Southern California. Available: https://maps.conservation.ca.gov/cgs/DataViewer/index.html. Accessed: March 10, 2024.

[33] De Novo Planning Group, 2022. Final Environmental Impact Report for the Lathrop General Plan Update. August.

include mammoth/mastodon, horse, pocket gopher, and other unspecified rodents, and unidentified artiodactyl (hoofed mammal) bone.

3.6.2 REGULATORY SETTING

FEDERAL

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act of 1977 (42 USC, 7701 et seq.) requires the establishment and maintenance of an earthquake hazards reduction program by the Federal government.

Executive Order 12699

Signed in January 1990, this executive order of the President implements provisions of the Earthquake Hazards Reduction Act for “federal, federally assisted or federally regulated new building construction” and requires the development and implementation of seismic safety programs by Federal agencies.

International Building Code

The purpose of the International Building Code (IBC) is to provide minimum standards to preserve the public peace, health, and safety by regulating the design, construction, quality of materials, certain equipment, location, grading, use, occupancy, and maintenance of all buildings and structures. IBC standards address foundation design, shear wall strength, and other structurally related conditions.

STATE

California Building Standards Code

Title 24 of the California Code of Regulations, known as the California Building Standards Code (CBSC) or simply "Title 24," contains the regulations that govern the construction of buildings in California. The CBSC includes 12 parts: California Building Standards Administrative Code, California Building Code, California Residential Building Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Historical Building Code, California Fire Code, California Existing Building Code, California Green Building Standards Code (CAL Green Code), and the California Reference Standards Code. Through the CBSC, the State provides a minimum standard for building design and construction. The CBSC contains specific requirements for seismic safety, excavation, foundations, retaining walls, and site demolition. It also regulates grading activities, including drainage and erosion control.

The California Building Code, Title 24, Part 2, Chapter 16 addresses structural design, Chapter 17 addresses structural tests and special inspections, and Chapter 18 addresses soils and foundations. Section 1610 provides structural design standards for foundation walls and retaining walls to ensure resistance to lateral soil loads. Section 1613 provides structural design standards for earthquake loads. Section 1704.7 requires special inspections for existing site soil conditions, fill placement and load-bearing requirements during the construction as specified in Table 1704.7 of this section. Sections 1704.8 through 1704.16 provide inspection and testing requirements for various foundation types, and construction material types. Section 1803.1.1.1 requires each city and county enact an ordinance which requires a preliminary soil report and that the report be based upon adequate test borings or excavations, of every subdivision, where a tentative and final map is required pursuant to Section 66426 of the Government Code. Section 1803.5.3 defines expansive soils and specifies that in areas likely to have expansive soil, the building official shall require soil tests to determine where such soils do exist. Section 1803.5.4 specifies that a subsurface soil investigation must be performed to determine whether the existing ground-water table is above or within 5 feet (1524 mm) below the elevation of the lowest floor level where such floor is located below the finished ground level adjacent to the foundation. Section 1803.5.8 provides specific standards where shallow foundations will bear on compacted fill material more than 12 inches (305 mm) in depth. Sections 1803.5.11 and 1803.5.12 provide requirements for geotechnical investigations for structures assigned varying Seismic Design Categories in accordance with Section 1613. Section 1804 provides standards and requirements for excavation, grading, and fill. Sections 1808, 1809, and 1810 provide standards and requirements for the construction of varying foundations.

California Health and Safety Code

Section 19100 et seq. of the California Health and Safety Code establishes the State's regulations for earthquake protection. This section of the code requires structural designs to be capable of resisting likely stresses produced by phenomena such as strong winds and earthquakes.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 sets forth the policies and Criteria of the State Mining and Geology Board, which governs the exercise of governments' responsibilities to prohibit the location of developments and structures for human occupancy across the trace of active faults. The policies and criteria are limited to potential hazards resulting from surface faulting or fault creep within Earthquake Fault Zones, as delineated on maps officially issued by the State Geologist. Working definitions include:

- Fault – a fracture or zone of closely associated fractures along which rocks on one side have been displaced with respect to those on the other side;
- Fault Zone – a zone of related faults, which commonly are braided and sub parallel, but may be branching and divergent. A fault zone has a significant width (with respect to the scale at which the fault is being considered, portrayed, or investigated), ranging from a few feet to several miles;
- Sufficiently Active Fault – a fault that has evidence of Holocene surface displacement along one or more of its segments or branches (last 11,000 years); and

- Well-Defined Fault – a fault whose trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The geologist should be able to locate the fault in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

"Sufficiently Active" and "Well Defined" are the two criteria used by the State to determine if a fault should be zoned under the Alquist-Priolo Act.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically-induced landslides. Under the Act, seismic hazard zones are to be mapped by the State Geologist to assist local governments in land use planning. The program and actions mandated by the Seismic Hazards Mapping Act closely resemble those of the Alquist-Priolo Earthquake Fault Zoning Act (which addresses only surface fault-rupture hazards) and are outlined below:

The State Geologist is required to delineate the various "seismic hazard zones."

- Cities and Counties, or other local permitting authority, must regulate certain development "projects" within the zones. They must withhold the development permits for a site within a zone until the geologic and soil conditions of the site are investigated and appropriate mitigation measures, if any, are incorporated into development plans.
- The State Mining and Geology Board provides additional regulations, policies, and criteria, to guide cities and counties in their implementation of the law. The Board also provides guidelines for preparation of the Seismic Hazard Zone Maps and for evaluating and mitigating seismic hazards.
- Sellers (and their agents) of real property within a mapped hazard zone must disclose that the property lies within such a zone at the time of sale.

National Pollutant Discharge Elimination System (NPDES)

National Pollutant Discharge Elimination System (NPDES) permits are required for discharges to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, oceans, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under the Federal Clean Water Act (CWA), Title IV, Permits and Licenses, Section 402 (33 USC 466 et seq.).

The Regional Water Quality Control Board (RWQCB) issues these permits in lieu of direct issuance by the EPA, subject to review and approval by the U.S. Environmental Protection Agency (EPA) Regional Administrator (EPA Region 9). The terms of these NPDES permits implement pertinent provisions of the CWA and implementing regulations, including pre-treatment, sludge management, effluent limitations for specific industries, and anti-degradation. In general, the discharge of pollutants is to be eliminated or reduced as much as practicable so as to achieve the CWA's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the RWQCB are also Waste Discharge Requirements issued under the authority of the CWA.

These NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less, and are therefore to be updated regularly. Individual projects in the City that disturb more than one acre would be required to obtain NPDES coverage under the California General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit). The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) describing best management practices (BMPs) the discharger would use to prevent and retain storm water runoff. The SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a waterbody listed on the 303(d) list for sediment.

A Phase II Small Municipal Separate Storm Sewer (MS4) General Permit was adopted by the SWRCB on February 5, 2013 (Water Quality Order No. 2013-0001-DWQ, NPDES NO. CAS000004, as amended).

State Laws Pertaining to Paleontological Resources

Section 5097.5 of the California Public Resources Code prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any "vertebrate paleontological site, including fossilized footprints," on public lands, except where the agency with jurisdiction has granted express permission. "As used in this section, 'public lands' means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof." Section 30244 of the California Public Resources Code requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

Section 4307–4309 of the California Code of Regulations relating to the Department of Parks and Recreation affords protection to geologic features, "paleontological features", and objects of archaeological, or historical interest or value, and grants the Department of Parks and Recreation the power to grant a permit to "remove, treat, disturb, or destroy plants or animals or geological, historical, archaeological or paleontological materials." (California Code of Regulations, Title 14, Section 4307–4309).

LOCAL

City of Lathrop General Plan

The City of Lathrop General Plan contains the following goals, policies and actions that are relevant to geology and soils:

PUBLIC SAFETY ELEMENT

GOAL PS-1. Prepare the community for natural hazards related to landslides, geologic instability, and seismic activity to minimize loss of life, injury, and property damage, and disruption of vital services.

Policy PS-1.1 Geologic Hazard Identification. Review and monitor geologic and seismic hazards maps in concert with updates from the California Geologic Survey and local surveys.

Policy PS-1.2 Earthquake Protection. Enforce State seismic design standards and guidelines and all relevant building codes to reduce the risk of damage associated with seismic activity.

Policy PS-1.3 Development. Require special site-specific studies, generally including but not limited to, soil compaction tests and geotechnical reports, for development projects and City improvement projects to determine the nature and extent of possible liquefaction, landslides, and geologic hazards, and to identify engineering and development siting measures to permit development to occur.

Policy PS-1.4 Development Inspection. Require professional inspection of foundation, excavation, earthwork, and other geotechnical aspects of site development during constructions on those sites specified in geotechnical studies as being prone to seismic or geologic hazard.

Policy PS-1.6 Title 24 Compliance. Require all structures located within areas containing expansive soils to be designed and engineered to comply with the California Code of Regulations (CCR), Title 24.

Action PS-1a Review development proposals to ensure compliance with:

A. Current State building standards;

B. California Health and Safety Code Section 19100 et seq. (Earthquake Protection Law), which requires that buildings be designed to resist stresses produced by natural forces such as earthquakes and wind; and

C. Lathrop Municipal Code drainage and erosion standards.

RECREATION AND RESOURCES

GOAL RR-3. Preserve and protect prehistoric, historic, archaeological, and paleontological resources, to bolster community identity and protect sensitive resources.

Policy RR-3.1 Preservation. Protect areas containing significant historic, archaeological, and paleontological resources, as defined by the California Public Resources.

Action RR-3d Require all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of a paleontological resource:

A. If construction or grading activities result in the discovery of significant prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Community Development Director shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Community Development Director.

City of Lathrop Municipal Code

Chapter 13.28, *Stormwater Management and Discharge Control*, contains the City's Stormwater Management and Discharge Control Ordinance. The purpose of the Ordinance is to establish minimum stormwater management requirements and controls to assist in the protection and enhancement of the water quality of watercourses, water bodies and wetlands in a manner pursuant to and consistent with the Federal CWA by reducing pollutants in stormwater discharges to the maximum extent practicable. In accordance with the Ordinance, all construction projects having soil disturbance or activities exposed to stormwater must implement BMPs for erosion and sediment controls, soil stabilization, source controls, pollution prevention measures, and prohibited discharges.

Title 15, *Buildings and Construction*, monitors and regulates buildings in the City through the establishment of construction, operation, and maintenance provisions. This title adopts the 2022 CBSC, including the California Building Code (CBC), the California Residential Code, the California Plumbing Code, the California Energy Code, and the California Green Building Standards Code (Cal Green), with local amendments.

Title 16, *Subdivisions*, contains the City's Subdivision Ordinance. Section 16.16.020, *Preliminary soil report and geological reports,* requires the preparation of a preliminary soil report by a state registered geotechnical engineer for any residential, commercial, industrial or institutional development, based upon adequate test borings or excavations, as determined by the building official. Additionally, a preliminary geologic report prepared by a state-certified engineering geologist, based on adequate test borings, is required to be submitted to the building official for every subdivision.

3.6.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed Project would have a significant impact on geology and soils if it would:

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
    - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42);
    - Strong seismic ground shaking;
    - Seismic-related ground failure, including liquefaction;
    - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water; and/or
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

CEQA TOPICS REQUIRING NO FURTHER ANALYSIS

As discussed in the Initial Study prepared for the proposed Project, the Project would connect to the municipal sewer system for wastewater disposal. Septic tanks or septic systems are not proposed as part of the Project. Therefore, there would be no impact regarding septic tanks or alternative waste water disposal systems, and no additional analysis of this CEQA topic is warranted. As such, this CEQA topic is not relevant to the proposed Project and does not require further analysis. This topic will not be further discussed.

IMPACTS AND MITIGATION MEASURES

Impact 3.6-1: Implementation of the proposed Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic related ground failure, or landslides. (Less than Significant)

As shown in Figure 3.6-2, the Project site is not located within a currently designated Alquist-Priolo Special Study Zone and no known surface expression of active faults is believed to exist within the site. The Vernalis Fault, located approximately four miles to the southwest of the Project site, is considered a potentially active fault and the Greenville fault, located approximately 23 miles to the west, is considered active. Other faults that could potentially affect the Project site include the Mount Diablo Thrust, Calaveras, Hayward, Ortigalita, and San Andreas Faults.

The Project site is not currently mapped for potential liquefaction hazard by the CGS; however, the General Plan EIR identifies areas along existing waterways, which would include the Project site, as having the greatest potential for liquefaction.

The Project site is not mapped for potential seismically-induced landslides by the CGS. The Development Area is essentially flat; therefore, the potential for a landslide is low.

The potential for groundshaking caused by seismic activity is present throughout California, including the Project site. Seismic activity could come from a known active fault or any number of other faults in the region, resulting in strong seismic ground shaking, seismic related ground failure, or earthquake-induced landslides. To reduce the potential impact of seismic ground shaking on the development, the Project would be required to comply with the provisions of the CBSC, which includes design requirements to mitigate the effects of potential hazards associated with seismic ground shaking. Further, the Project would be reviewed by the City for conformance with the General Plan, Municipal Code, and other regulations that address seismic safety issues and would be required to comply with standard engineering and seismic safety design considerations to minimize potential impacts. Therefore, with the implementation of the applicable State and City codes, potential impacts associated with a seismic event, including rupture of an earthquake fault, seismic ground shaking, liquefaction, and landslides would be ***less than significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.6-2: Implementation of the proposed Project would not result in substantial soil erosion or the loss of topsoil. (Less than Significant)

The Project would provide for development and associated improvements that would involve some land clearing, mass grading, and other ground-disturbing activities that could temporarily increase soil erosion rates during and shortly after project construction. Construction-related erosion could result in the loss of a substantial amount of nonrenewable topsoil and could adversely affect water quality in nearby surface waters. As described above, Project site soils exhibit erosion factor values (Kf) that are considered to have a low to moderate potential for erosion. Furthermore, because the Development Area is essentially flat, the erosion potential is slight.

The Project would be evaluated for conformance with the CBSC, General Plan, Municipal Code, and other regulations that address construction activities and soil erosion. Each phase of Project construction disturbing one acre or more of soil would be required to obtain coverage under the

Construction General Permit prior to issuance of a grading permit. The Construction General Permit requires development and implementation of a SWPPP and monitoring plan, which must include erosion-control and sediment-control BMPs that would meet or exceed measures required by the Construction General Permit to control stormwater quality degradation due to potential construction-related pollutants. Further, Project construction would be required to implement construction site control BMPs in compliance with the City's Stormwater Management and Discharge Control Ordinance and NPDES Permit. With implementation of the policies and actions in the General Plan, as well as applicable State and City requirements, potential impacts associated with erosion and loss of topsoil would be ***less than significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.6-3: Implementation of the proposed Project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of Project implementation, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. (Less than Significant)

Landslide. As previously discussed, the Development Area is essentially flat and ranges from approximately 14 feet to 21 feet above mean sea level; therefore, the potential for a landslide is low.

Subsidence. Subsidence has not been identified in the Lathrop General Plan as an issue in the Project Area.

Liquefaction and Lateral Spreading. As previously discussed, the Project site is not currently mapped for potential liquefaction hazard by the CGS. The potential for liquefaction is highest when groundwater levels are high, and loose, fine, sandy soils occur at depths of less than 50 feet. According to the General Plan EIR, soil data suggests that the potential for liquefaction ranges from low to high within the General Plan Planning Area, given that many soils are high in sand and the water table is moderately high. The General Plan EIR identifies areas along existing waterways, which would include the Project site, as having the greatest potential for liquefaction.

According to the Lathrop General Plan EIR, lateral spreading of soils has not been observed within the Lathrop area. However, as lateral spreading is often directly associated with areas of liquefaction and the Project site is identified as having the potential for liquefaction, the potential for lateral spreading is also present.

Collapsible Soils. Collapsible soils have not been identified in the Lathrop General Plan EIR as an issue in the Lathrop area. However, in areas subject to potential liquefaction, the potential for liquefaction induced settlement is present.

Conclusion. The Project site does not have a significant risk of becoming unstable as a result of landslide, subsidence, or soil collapse. There is some potential for liquefaction, liquefaction induced settlement, and lateral spreading. The Project would be evaluated for conformance with the CBSC, the General Plan, the Municipal Code, and other regulations. In accordance with the City's Subdivision Ordinance (Title 16), a preliminary soil report and geologic report prepared by a geotechnical engineer must be submitted to the City along with the Project final map. The geotechnical evaluation would include design recommendations to ensure that geologic and soil conditions do not pose a threat to the health and safety of people or structures. Implementation of the design recommendations would ensure that all on-site fill soils are properly compacted and comply with the applicable safety requirements established by the CBC to reduce risks associated with unstable soils and excavations and fills, and that any issues associated with unstable soils are addressed at the design level. Implementation of CBSC and the Municipal Code requirements related to geologic conditions, as well as compliance with General Plan policies, would ensure that future development projects are evaluated for potential geologic risks and that potential risks are adequately addressed. Compliance with applicable State and City regulations would reduce potential impacts associated with unstable geologic and soil conditions to ***less than significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.6-4: Implementation of the proposed Project would not result in development on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property. (Less than Significant)

Expansive soils are those that undergo volume changes as moisture content fluctuates; swelling substantially when wet or shrinking when dry. Expansive soils may swell considerably when wetted and shrink when dried. Expansive soils can be hazardous to structures and may cause cracks in building foundations, distortion of structural elements, and warping of doors and windows. Structural damage, such as warping and cracking of improvements, and rupture of underground utility lines, may occur if the expansive potential of soils is not considered during the design and construction of all improvements. According to the Lathrop General Plan EIR, the soils in Project site generally have a low to moderate shrink-swell potential.

The Project would be evaluated for conformance with the CBSC, the General Plan, the Municipal Code, and other regulations. In accordance with the City's Subdivision Ordinance (Title 16), a preliminary soil report and geologic report prepared by a geotechnical engineer must be submitted to the City along with the Project final map. The geotechnical evaluation would include design recommendations to ensure that geologic and soil conditions do not pose a threat to the health and safety of people or structures. Implementation of the design recommendations would ensure that all on-site fill soils are properly compacted and comply with the applicable safety requirements established by the CBC to reduce risks associated with unstable soils and excavations and fills, and that any issues associated with unstable soils are addressed at the design level. Implementation of CBSC and the Municipal Code requirements related to geologic conditions, as well as compliance with General Plan policies, would ensure that future development projects are evaluated for potential geologic risks and that potential risks are adequately addressed. Compliance with applicable State and City regulations would reduce potential impacts associated with expansive soils to ***less than significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.6-5: Implementation of the proposed Project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (Less than Significant)

The Project site is located in an area known to have paleontological resources. As previously mentioned, the General Plan EIR included a search of the database of the UCMP Collections, which identified 80 fossils that have been found and recorded within San Joaquin County. The majority of fossils found within the Lathrop area have been vertebrate in nature. These fossils include mammoth/mastodon, horse, pocket gopher, and other unspecified rodents, and unidentified artiodactyl (hoofed mammal) bone.

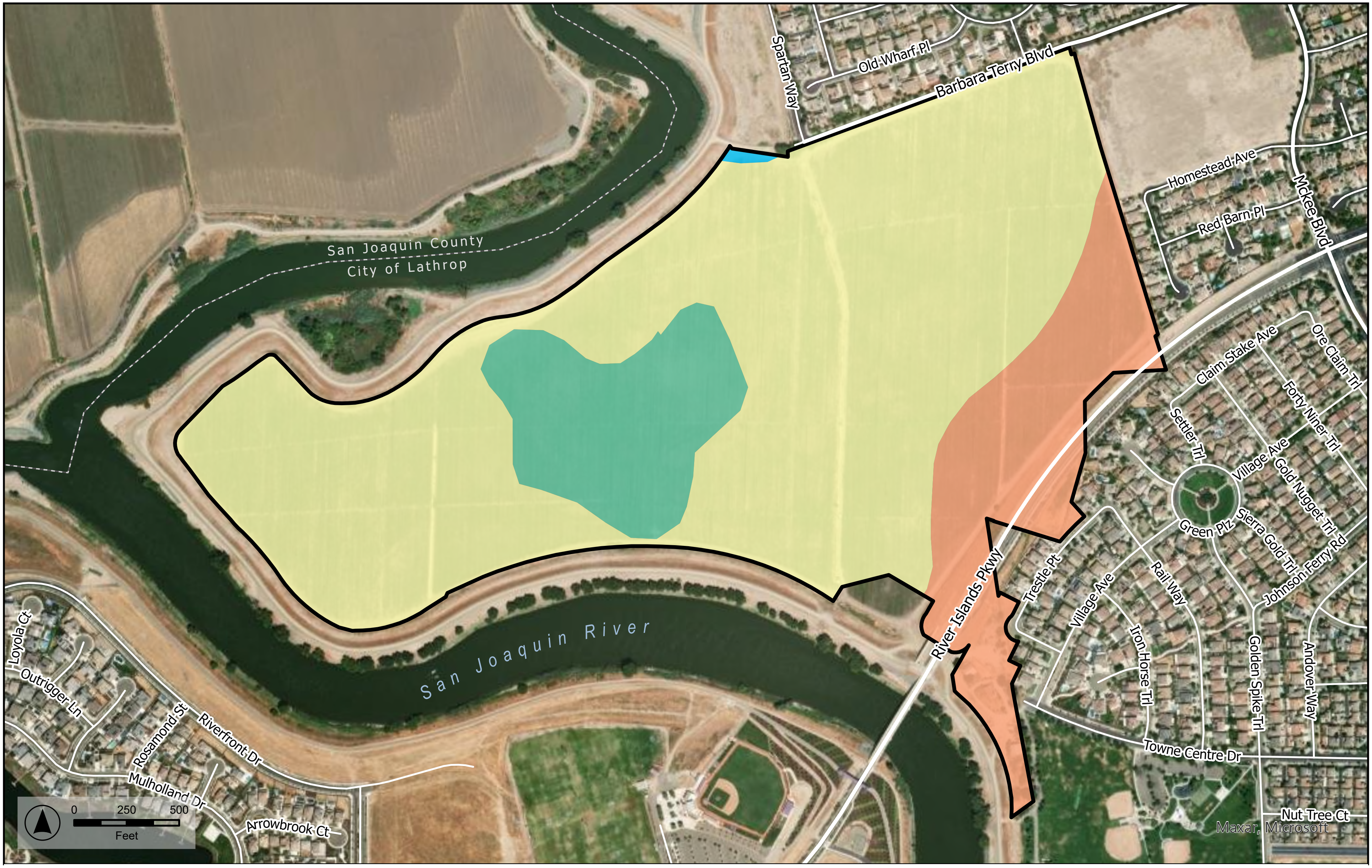
The Project would provide for development and associated improvements that would involve construction activities such as grading, excavation, and other ground-disturbing activities with the potential to result in the accidental destruction or disturbance of paleontological resources. The Project site is currently vacant/undeveloped, consisting primarily of farmland, and has undergone extensive previous grading. While the Project is not anticipated to directly or indirectly impact previously undiscovered paleontological resources, there is the potential for Project excavation activities to encounter paleontological resources. The Project would be required to comply with the General Plan, including Recreation and Resources Element Action RR-3d. In compliance with Action RR-3d, if Project construction or grading activities result in the discovery of significant prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Community Development Director shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Community Development Director. Compliance with applicable City regulations would reduce potential impacts associated with paleontological resources or unique geologic features to ***less than significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.



Legend

- Project Boundary
- 130 - Columbia fine sandy loam, drained, 0-2% slopes, MLRA 17
- 148 - Dello clay loam, drained, 0-2% slopes, overwashed
- 153 - Egbert silty clay loam, partially drained, 0-2% slopes, MLRA 16
- 197 - Merritt silty clay loam, partially drained, 0-2% slopes

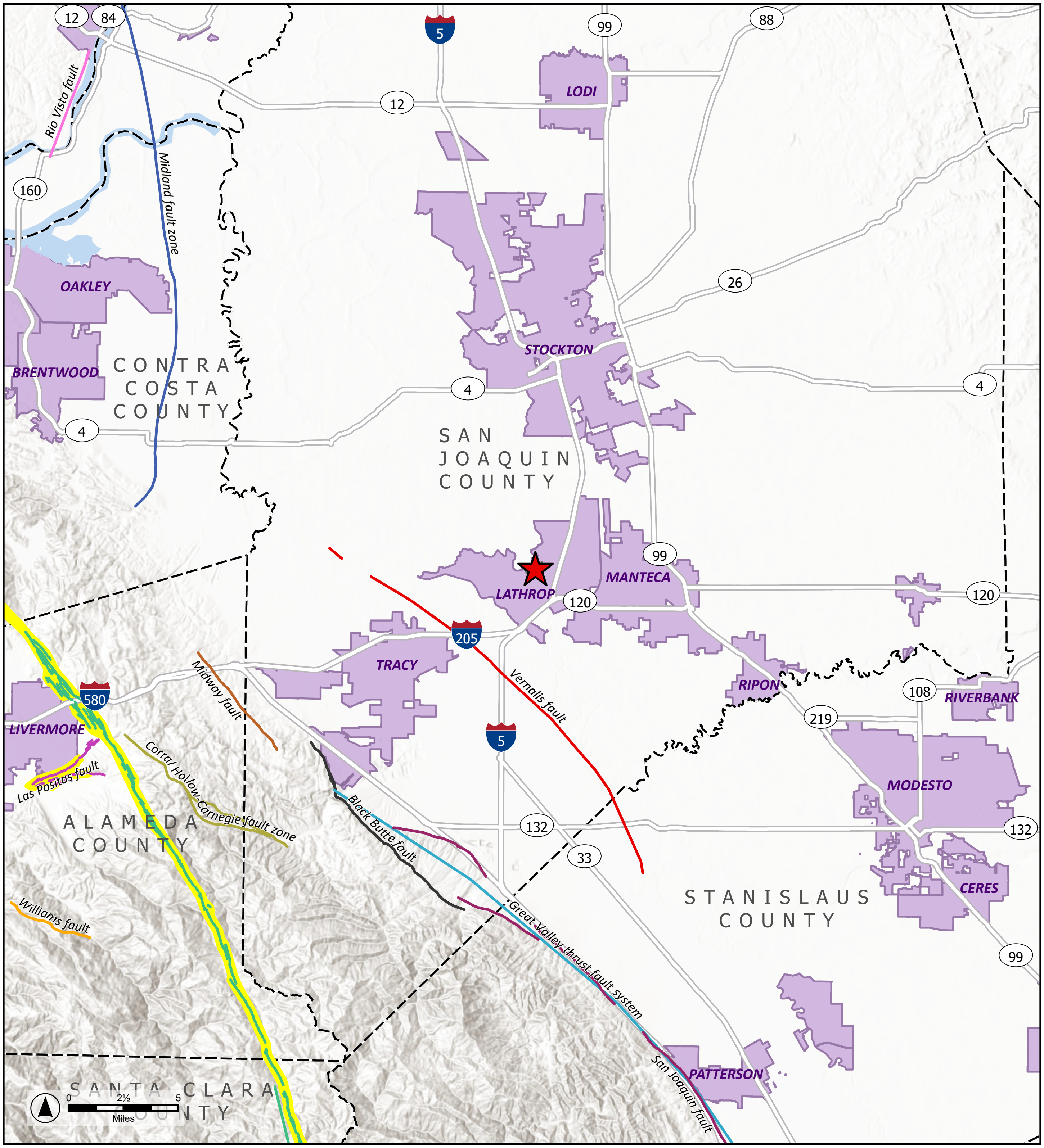
LATHROP MOSSDALE WEST

Figure 3.6-1. Project Site Soils

Sources: NRCS USA Soils, accessed 3-8-2024; San Joaquin County GIS. Map date: March 11, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



Legend

- Project Location
- Incorporated Area
- County Area
- Alquist-Priolo Zone of Required Investigation
- Black Butte fault
- Corral Hollow-Carnegie fault zone
- Great Valley thrust fault system
- Greenville fault zone
- Las Positas fault
- Midland fault zone
- Midway fault
- Rio Vista fault
- San Joaquin fault
- Vernalis fault
- Williams fault

LATHROP MOSSDALE WEST

Figure 3.6-2. Earthquake Faults

Sources: USGS; CGS; California State Geoportal. Map date: March 11, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

This section discusses regional greenhouse gas (GHG) emissions, climate change, and energy conservation impacts that could result from Project implementation. The analysis contained in this section is intended to be at a Project-level, and covers impacts associated with the conversion of the entire Master Plan site to urban uses. This section provides a background discussion of GHGs and climate change linkages and effects of global climate change. This section is organized with an existing setting, regulatory setting, approach/methodology, and impact analysis. The analysis and discussion of the GHG, climate change, and energy conservation impacts in this section focuses on the proposed Project's consistency with local, regional, and statewide climate change planning efforts and discusses the context of these planning efforts as they relate to the proposed Project. Disclosure and discussion of the Project's estimated energy usage and GHG emissions are provided.

There was one comment received during the Notice of Preparation (NOP) comment period regarding GHGs, climate change, energy. The comment letter was provided from the San Joaquin Valley Air Pollution Control District (April 24, 2024). All comments are included in Appendix A.

3.7.1 Environmental Setting

Greenhouse Gases and Climate Change Linkages

Various gases in the Earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Naturally occurring GHGs include water vapor (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and ozone (O_3). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also GHGs, but they are, for the most part, solely a product of industrial activities. Although the direct GHGs CO_2, CH_4, and N_2O occur naturally in the atmosphere, human activities have changed their atmospheric concentrations. From the pre-industrial era (i.e., ending about 1750) to 2019, concentrations of these three GHGs have increased globally by 47, 156, and 23 percent, respectively (IPCC, 2023).

GHGs, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), ozone (O_3), water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs).

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. In California, the transportation sector is the largest emitter of GHGs, followed by the industrial and electricity generation sectors (California Energy Commission, 2023).

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California produced 369 million gross metric tons of carbon dioxide equivalents ($MMTCO_2e$) in 2022 (California Air Resources Board, 2023).

Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2022, accounting for 38% of total GHG emissions in the State. This category was followed by the industrial sector (23%), the electricity generation sector (including both in-state and out of-state sources) (16%), the agriculture and forestry sector (9%), the residential energy consumption sector (8%), and the commercial energy consumption sector (6%) (California Air Resources Board, 2023).

EFFECTS OF GLOBAL CLIMATE CHANGE

The effects of increasing global temperature are far-reaching and extremely difficult to quantify. The scientific community continues to study the effects of global climate change. In general, increases in the ambient global temperature because of increased GHGs are anticipated to result in rising sea levels, which could threaten coastal areas through accelerated coastal erosion, threats to levees and inland water systems and disruption to coastal wetlands and habitat.

If the temperature of the ocean warms, it is anticipated that the winter snow season would be shortened. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the State. The snowpack portion of the supply could potentially decline by 50% to 75% by the end of the 21st century (National Resources Defense Council, 2014). This phenomenon could lead to significant challenges securing an adequate water supply for a growing state population. Further, the increased ocean temperature could result in increased moisture flux into the State; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's levee/flood control system.

Sea level has risen approximately seven inches during the last century and it is predicted to rise an additional 22 to 35 inches by 2100, depending on the future GHG emissions levels. If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion, and disruption of wetlands. As the existing climate throughout California changes over time, mass migration of species, or failure of species to migrate in time to adapt to the perturbations in climate, could also result. According to the Indicators of Climate Change in California report (OEHHA, 2022), the impacts of global warming in California are anticipated to include, but are not limited to, the following (and as provided by further discussion below):

- Public Health;
- Water Resources;
- Agriculture;
- Forest and Landscapes;
- Rising Sea Levels

Public Health

Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation are projected to increase from 25% to 35% under the lower warming range and to 75% to 85% under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55% more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures will increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

Water Resources

A vast network of man-made reservoirs and aqueducts capture and transport water throughout the State from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snow pack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snow pack, increasing the risk of summer water shortages.

The State's water supplies are also at risk from rising sea levels. An influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta, a major State fresh water supply. Global warming is also projected to seriously affect agricultural areas, with California farmers projected to lose as much as 25% of the water supply they need; decrease the potential for hydropower production within the State (although the effects on hydropower are uncertain); and seriously harm winter tourism.

Under the lower warming range, the snow dependent winter recreational season at lower elevations could be reduced by as much as one month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing, snowboarding, and other snow dependent recreational activities.

If GHG emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snow pack by as much as 70% to 90%. Under the lower warming scenario, snow pack losses are expected to be only half as large as those expected if temperatures were to rise to the higher warming range. How much snow pack will be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snow pack would pose challenges to water managers, hamper hydropower generation, and nearly eliminate all skiing and other snow-related recreational activities.

Agriculture

Increased GHG emissions are expected to cause widespread changes to the agriculture industry, reducing the quantity and quality of agricultural products statewide. Although higher carbon dioxide levels can stimulate plant production and increase plant water-use efficiency, California's farmers will face greater water demand for crops and a less reliable water supply as temperatures rise.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for several of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts, and milk.

Crop growth and development will be affected, as will the intensity and frequency of pest and disease outbreaks. Rising temperatures will likely aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

In addition, continued global warming will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Should range contractions occur, it is likely that new or different weed species will fill the emerging gaps. Continued global warming is also likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

Forests and Landscapes

Global warming is expected to alter the distribution and character of natural vegetation thereby resulting in a possible increased risk of large wildfires. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55%, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the State. For example, if precipitation increases as temperatures rise, wildfires in southern California are expected to increase by approximately 30% toward the end of the century. In contrast, precipitation decreases could increase wildfires in northern California by up to 90%.

Moreover, continued global warming will alter natural ecosystems and biological diversity within the State. For example, alpine and sub-alpine ecosystems are expected to decline by as much as 60% to 80% by the end of the century because of increasing temperatures. The productivity of the State's forests is also expected to decrease because of global warming.

Rising Sea Levels

Rising sea levels, more intense coastal storms, and warmer water temperatures will increasingly threaten the State's coastal regions. Under the higher warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

ENERGY CONSUMPTION

Energy in California is consumed from a wide variety of sources. Fossil fuels (including gasoline and diesel fuel, natural gas, and energy used to generate electricity) are the most widely used form of energy in the State. However, renewable sources of energy (such as solar and wind) are growing in proportion to California's overall energy mix. A large driver of renewable sources of energy in California is the State's current Renewable Portfolio Standard (RPS), which requires the State to derive at least 60 percent of electricity generated by 2030, and to achieve zero-carbon emissions by 2045 (as passed in September 2018, under Senate Bill 100). The 2021 SB 100 Joint Agency Report was published in 2021, which found that the long-term goals contained in SB 100 are technically achievable through multiple pathways, although achieving 100 clean electricity would increase the total annual electricity system cost by 6% relative to the cost under the state's Renewables Portfolio Standard requirement of having at least 60 percent clean electricity by the end of 2030. These estimates will change over time as markets change, new technologies are commercialized, and additional factors such as grid reliability are included in future analyses.

Overall, in 2019, California's per capita energy usage was ranked second-lowest in the nation (U.S. Energy Information Administration, 2020b). California's per capita rate of energy usage has remained relatively constant since the 1970's. Many State regulations since the 1970s, including new building energy efficiency standards, vehicle fleet efficiency measures, as well as growing public awareness, have helped to keep per capita energy usage in the State in check.

The consumption of non-renewable energy (i.e., fossil fuels) associated with the operation of passenger, public transit, and commercial vehicles results in GHG emissions that contribute to global climate change. Alternative fuels such as natural gas, ethanol, and electricity (unless derived from solar, wind, nuclear, or other energy sources that do not produce carbon emissions) also result in GHG emissions and contribute to global climate change.

Electricity Consumption

California relies on a regional power system composed of a diverse mix of natural gas, renewable, hydroelectric, and a very small amount of nuclear generation resources. In 2020, nearly one-half of the electricity supply came from facilities outside of the State. Much of the power delivered to California from states in the Pacific Northwest was generated by wind. States in the Southwest delivered power generated at coal-fired power plants, at natural gas-fired power plants, and from nuclear generating stations (U.S. Energy Information Administration, 2022). In 2020, approximately 41 percent of California's utility-scale net electricity generation was fueled by natural gas. In addition, about 48 percent of the State's utility-scale net electricity generation came from renewable sources, such as solar, wind, geothermal, hydropower, and biomass. Nuclear energy powered an additional 11 percent. The amount of electricity generated from coal was effectively zero (U.S. Energy Information Administration, 2022). The percentage of renewable resources as a proportion of California's overall energy portfolio is increasing over time, as directed the State's Renewable Portfolio Standard (RPS).

According to the California Energy Commission (CEC), total statewide electricity consumption increased from 166,979 gigawatt-hours (GWh) in 1980 to 228,038 GWh in 1990, which is an estimated annual growth rate of 3.66 percent. The statewide electricity consumption in 1997 was 246,225 GWh, reflecting an annual growth rate of 1.14 percent between 1990 and 1997 (U.S. Energy Information Administration, 2023b). Statewide consumption was 274,985 GWh in 2010, an annual growth rate of 0.9 percent between 1997 and 2010.

PG&E is a publicly traded utility company that, under contract with the California Public Utilities Commission (CPUC), generates, purchases, and distributes energy. PG&E's service area covers 70,000 square miles, roughly extending north to south from Eureka to Bakersfield and east to west from the Sierra Nevada to the Pacific Ocean. PG&E's electricity distribution system consists of 106,681 circuit miles of electric distribution lines and 18,466 circuit miles of interconnected transmission lines.

PG&E's electricity is generated from a combination of traditional sources, such as coal-fired plants, nuclear power plants, and hydroelectric dams, as well as newer sources of energy, such as wind turbines and photovoltaic plants, or "solar farms." "The grid," or bulk electric grid, is a network of high-voltage transmission lines that link power plants to the PG&E system. The distribution system, comprising lower-voltage secondary lines, is at the street and neighborhood level. It consists of overhead or underground distribution lines, transformers, and individual service "drops" that connect to individual customers.

In addition to its base plan, PG&E has three plan options, known as Solar Choice options and Green Saver, which give customers the option of purchasing energy from solar resources. The first Solar Choice option provides up to 50 percent of a customer's energy from solar resources, while the other option provides up to 100 percent of a customer's energy from solar resources, and the Green Saver option provides up to 90 percent of a customer's energy from solar resources.

Table 3.7-1 outlines PG&E's power mix in 2022, compared to the power mix for the state. The table identifies the renewable and non-renewable energy sources for PG&E. It should be noted that some GHG free sources are not considered renewable (e.g., nuclear is GHG free but not renewable).

TABLE 3.7-1. PG&E AND THE STATE OF CALIFORNIA POWER MIX IN 2021

ENERGY RESOURCES	*CALIFORNIA POWER MIX 2022*
Overall Eligible Renewable	**54.23%**
Biomass	2.15%
Geothermal	4.67%
Small hydroelectric	1.12%
Solar	17.04%
Wind	10.83%
Coal	2.15%
Oil	0.02%
Large Hydroelectric	9.24%
Natural Gas	36.38%
Nuclear	9.18%
Other (Waste Petroleum/Petroleum Coke	0.11%
Unspecified[A]	7.11%

SOURCE: PG&E. 2023. 2022 POWER CONTENT LABEL. AVAILABLE: HTTPS://WWW.PGE.COM/CONTENT/DAM/PGE/DOCS/ACCOUNT/BILLING-AND-ASSISTANCE/POWER-CONTENT-LABEL.PDF. ACCESSED: AUGUST 15, 2024.

[A]ELECTRICITY FROM TRANSACTIONS THAT ARE NOT TRACEABLE TO SPECIFIC GENERATION SOURCES ARE CLASSIFIED AS UNSPECIFIED SOURCES OF POWER.

In 2022, the latest year for which data is available, statewide consumption was 277,205 GWh (California Energy Commission, 2024). In 2022, electricity consumption in San Joaquin County was 5,772 GWh (California Energy Commission, 2024).

Oil

The primary energy source for the United States is oil, which is refined to produce fuels like gasoline, diesel, and jet fuel. Oil is a finite, nonrenewable energy source. World consumption of petroleum products has grown steadily in the last several decades. As of 2019, world consumption of oil had reached approximately 98 million barrels per day. The United States, with approximately five percent of the world's population, accounts for approximately 19 percent of world oil consumption, or approximately 18.6 million barrels per day (U.S. EIA, 2023). The transportation sector relies heavily on oil. In California, petroleum-based fuels currently provide approximately 95 percent of the State's transportation energy needs.

Natural Gas/Propane

The State produces approximately 12 percent of its natural gas, while obtaining 22 percent from Canada and 65 percent from the Rockies and the Southwest (California Energy Commission, 2012). PG&E is the largest publicly-traded utility in California and provides natural gas for residential, industrial, and agency consumers within the San Joaquin County area. PG&E's natural gas (i.e., methane) delivery system includes 42,000 miles of natural gas distribution pipelines and 6,700 miles of transmission pipelines. PG&E's gas transmission system serves approximately 15 million energy customers in California. The system is operated under an inspection and monitoring program in real time on a 24-hour basis, with leak inspections, surveys, and patrols continuously taking place along the pipelines. Gas delivered by PG&E originates in gas fields in California, the Southwest, the Rocky Mountains, and Canada. Transmission pipelines send natural gas from the fields and storage facilities. The smaller distribution pipelines deliver gas to individual businesses or residences.

As of March 2022, California produced 11.4 billion cubic feet of natural gas per month (U.S. EIA, 2022). In 2022, natural gas consumption in San Joaquin County was approximately 187 million therms (California Energy Commission, 2024). Residential natural gas consumption in the county accounted for approximately 90 million therms.

3.7.2 REGULATORY SETTING

FEDERAL

Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, hazardous air pollutant standards, State attainment plans, NAAQS motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The EPA is responsible for administering the FCAA. The FCAA requires the EPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

In 2007, in the court case of *Massachusetts et al. vs. the USEPA et al*. (549 U.S. 497), the U.S. Supreme Court found that GHGs are air pollutants covered by the Federal Clean Air Act (42 USC Sections 7401-7671q). The Supreme Court held that the Administrator of the United States Environmental Protection Agency must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the Administrator is required to follow the language of Section 202(a) of the Clean Air Act. On December 7, 2009, the Administrator signed two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations.

- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action was a prerequisite for implementing GHG emission standards for vehicles. In collaboration with the National Highway Traffic Safety Administration (NHTSA) and CARB, the USEPA developed emission standards for light-duty vehicles (2012-2025 model years), and heavy-duty vehicles (2014-2027 model years).

Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards.

Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined based on each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by the EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.

Federal Climate Change Policy

According to the U.S. EPA, "the United States government has established a comprehensive policy to address climate change" that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, "the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science." The U.S. EPA administers multiple programs that encourage voluntary GHG reductions, including "ENERGY STAR," "Climate Leaders," and Methane Voluntary Programs.

The following are actions taken at the federal level relating to GHG emissions.

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. On April 1, 2010, the U.S. EPA and the

Department of Transportation's National Highway Safety Administration announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States.

The first phase of the national program applies to passenger cars, light duty trucks, and medium duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements. The U.S. EPA and the National Highway Safety Administration issued final rules on a second phase joint rulemaking, establishing national standards for light duty vehicles for model years 2017 through 2025 in August 2012.[1] The standards for model years 2017 through 2025 apply to passenger cars, light duty trucks, and medium duty passenger vehicles. The final standards are projected to result in an average industry fleetwide level of 163 grams/mile of CO2 in model year 2025, which is equivalent to 54.5 miles per gallon (mpg) if achieved exclusively through fuel economy improvements.

The U.S. EPA and the U.S. Department of Transportation issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks and buses on September 15, 2011, which became effective November 14, 2011. For combination tractors, the agencies adopted engine and vehicle standards that began in the 2014 model year and achieved up to a 20 percent reduction in CO2 emissions and fuel consumption by the 2018 model year. For heavy-duty pickup trucks and vans, the agencies adopted separate gasoline and diesel truck standards, which phased in starting in the 2014 model year.

Mandatory Reporting of Greenhouse Gases. The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the U.S. EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule, which became effective January 1, 2010. The rule requires reporting of GHG emissions from large sources and suppliers in the United States and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the U.S. EPA.

Cap and Trade. Cap and trade refer to a policy tool where emissions are limited to a certain amount and can be traded, or provides flexibility on how the emitter can comply. There is no federal GHG cap-and-trade program currently; however, some states have joined to create initiatives to provide a mechanism for cap and trade.

The Western Climate Initiative partner jurisdictions have developed a comprehensive initiative to reduce regional GHG emissions to 15 percent below 2005 levels by 2020. The partners are California, British Columbia, Manitoba, Ontario, and Quebec. Currently, only California and Quebec are participating in the cap-and-trade program.

[1] United States Environmental Protection Agency (EPA). 2012. EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks. Website: http://www.epa.gov/otaq/climate/documents/420f12051.pdf. Accessed August 2024.

STATE

The California Legislature has enacted a series of statutes in recent years addressing the need to reduce GHG emissions across the State. These statutes can be categorized into four broad categories: (i) statutes setting numerical statewide targets for GHG reductions, and authorizing CARB to enact regulations to achieve such targets; (ii) statutes setting separate targets for increasing the use of renewable energy for the generation of electricity throughout the State; (iii) statutes addressing the carbon intensity of vehicle fuels, which prompted the adoption of regulations by CARB; and (iv) statutes intended to facilitate land use planning consistent with statewide climate objectives. The discussion below will address each of these key sets of statutes, as well as Executive Orders and CARB "Scoping Plans" intended to achieve GHG reductions under the first set of statutes and recent building code requirements intended to reduce energy consumption.

Statutes Setting Statewide GHG Reduction Targets

ASSEMBLY BILL 32 (GLOBAL WARMING SOLUTIONS ACT)

In 2006, the California State Legislature enacted the California Global Warming Solutions Act of 2006 (Health & Safety Code Section 38500 et seq.), also known as Assembly Bill (AB) 32 (Stats. 2006, ch. 488). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 required that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction was accomplished through an enforceable statewide cap on GHG emissions that was phased in starting in 2012. To effectively implement the cap, AB 32 directed the CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources.

SENATE BILL 32

SB 32 (Stats. 2016, ch. 249) added Section 38566 to the Health and Safety Code. It provides that "[i]n adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions authorized by [Division 25.5 of the Health and Safety Code], [CARB] shall ensure that statewide GHG emissions are reduced to at least 40 percent below the statewide GHG emissions limit no later than December 31, 2030." In other words, SB 32 requires California, by 2030, to reduce its statewide GHG emissions so that they are 40 percent below those that occurred in 1990.

EXECUTIVE ORDERS S-3-05, B-30-15, AND B-55-18

The 2020 statewide GHG reduction target in AB 32 was consistent with the second of three statewide emissions reduction targets set forth in former Governor Arnold Schwarzenegger's 2005 Executive Order known as S-3-05, which is expressly mentioned in AB 32. (See Health & Safety Code Section 38501, subd. (i).) That Executive Branch document included the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels. To meet the targets, the Governor directed several State agencies to cooperate in the development of a climate action plan. The Secretary of Cal-EPA leads the Climate Action Team, whose goal is to implement global warming emission reduction programs identified in the Climate Action Plan and to report on the progress made toward meeting the emission reduction targets established in the executive order.

In 2015, Governor Brown issued Executive Order, B-30-15, which created and established a “new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050.” SB 32 codified this target.

In 2018, the Governor issued Executive Order B-55-18, which established a statewide goal to “achieve carbon neutrality as soon as possible, and no later than 2045, and maintain and achieve negative emissions thereafter.” The order directs the CARB to work with other State agencies to identify and recommend measures to achieve those goals. As discussed below, the 2022 Scoping Plan lays out a path towards achieving carbon neutrality by 2045.

SB 350

Senate Bill 350 (SB 350) (Stats. 2015, ch. 547) added to the Public Utilities Code language that puts into statute the 2050 GHG reduction target identified in Executive Order S-3-05, albeit in the limited context of new state policies (i) increasing the overall share of electricity that must be produced through renewable energy sources and (ii) directing certain State agencies to begin planning for the widespread electrification of the California vehicle fleet. Section 740.12(a)(1)(D) of the Public Utilities Code states that “[t]he Legislature finds and declares [that] … [r]educing emissions of [GHGs] to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050 will require widespread transportation electrification.” Furthermore, Section 740.12(b) states that the California Public Utilities Commission (CPUC), in consultation with CARB and the California Energy Commission (CEC), must “direct electrical corporations to file applications for programs and investments to accelerate widespread transportation electrification to reduce dependence on petroleum, meet air quality standards, … and reduce emissions of GHGs to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050.”

AB 1279

In September 2022, the Legislature enacted AB 1279 (Stats. 2022, ch. 337). The bill declares the policy of the state to achieve net zero GHG emissions as soon as possible, but no later than 2045, and achieve and maintain net negative GHG emissions thereafter. Additionally, the bill requires that by 2045, statewide anthropogenic GHG emissions be reduced to at least 85% below 1990 levels.

Statutes Setting Target for the Use of Renewable Energy for the Generation of Electricity

CALIFORNIA RENEWABLES PORTFOLIO STANDARD

Senate Bill X1-2 (Stats. 2011, 1st Ex. Sess., ch. 1) set aggressive statutory targets for renewable electricity, culminating in the requirement that 33 percent of the State's electricity come from renewables by 2020. This legislation applies to all electricity retailers in the State, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. All these entities were required to meet renewable energy goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020. (See Pub. Utility Code, Section 399.11 et seq. [subsequently amended].) SB 350, discussed below, increases the Renewable Portfolio Standard to require 50 percent of electricity generated to be from renewables by 2030. (Pub. Utility Code, Section 399.11, subd (a); see also Section 399.30, subd. (c)(2).) In 2018, Senate Bill 100 (Stats. 2018, ch. 312) revised the above-described deadlines and targets so that the State will have to achieve 50% renewable resources target by December 31, 2026 (instead of by 2030) and achieve a 60% target by December 31, 2030. The legislation also establishes a State policy that eligible renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers and 100% of electricity procured to serve all State agencies by December 31, 2045.

Statutes and CARB Regulations Addressing the Carbon Intensity of Petroleum-based Transportation Fuels

ASSEMBLY BILL 1493, PAVLEY CLEAN CARS STANDARDS

In 2002, the Legislature enacted Assembly Bill 1493 ("Pavley Bill") (Stats. 2002, ch. 200), which directed CARB to develop and adopt regulations that achieve the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks beginning with model year 2009. (See Health and Safety Code Section 43018.5.) In September 2004, pursuant to this directive, CARB approved regulations to reduce GHG emissions from new motor vehicles beginning with the 2009 model year. These regulations created what are commonly known as the "Pavley standards." In September 2009, CARB adopted amendments to the Pavley standards to reduce GHG emissions from new motor vehicles through the 2016 model year. These regulations created what are commonly known as the "Pavley II standards." (See California Code of Regulations, Title 13, Sections 1900, 1961, and 1961.1 et seq.)

In 2012, CARB adopted an Advanced Clean Cars (ACC) program aimed at reducing both smog-causing pollutants and GHG emissions for vehicles model years 2017-2025. This historic program, developed in coordination with the USEPA and NHTSA, combined the control of smog-causing (criteria) pollutants and GHG emissions into a single coordinated set of requirements for model years 2015 through 2025. The regulations focus on substantially increasing the number of plug-in hybrid cars and zero-emission vehicles in the vehicle fleet and on making fuels such as electricity and hydrogen readily available for these vehicle technologies. The components of the ACC program are the Low-Emission Vehicle (LEV) regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the Zero-Emission Vehicle (ZEV) regulation, which requires manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles in the 2018 through 2025 model years. (See California Code of Regulations, Title 13, Sections 1900, 1961, 1961.1, 1961.2, 1961.3, 1965, 1968.2, 1968.5, 1976, 1978, 2037, 2038, 2062, 2112, 2139, 2140, 2145, 2147, 2235, and 2317 et seq.)

It is expected that the Pavley regulations will reduce GHG emissions from California passenger vehicles by about 34 percent below 2016 levels by 2025, all while improving fuel efficiency and reducing motorists' costs.

Statute Intended to Facilitate Land Use Planning Consistent with Statewide Climate Objectives

CALIFORNIA SENATE BILL 375 (SUSTAINABLE COMMUNITIES STRATEGY)

This 2008 legislation built on AB 32 by setting forth a mechanism for coordinating land use and transportation on a regional level for the purpose of reducing GHGs. The focus is to reduce miles traveled by passenger vehicles and light trucks. CARB is required to set GHG reduction targets for each metropolitan region for 2020 and 2035.[2] Each of California's metropolitan planning organizations then prepares a sustainable communities strategy that demonstrates how the region will meet its GHG reduction target through integrated land use, housing, and transportation planning. Once adopted by the metropolitan planning organizations, the sustainable communities strategy is to be incorporated into that region's federally enforceable regional transportation plan. If a metropolitan planning organization is unable to meet the targets through the sustainable communities strategy, then an alternative planning strategy must be developed that demonstrates how targets could be achieved, even if meeting the targets is deemed to be infeasible.

Climate Change Scoping Plans

2022 SCOPING PLAN UPDATE

In accordance with AB 32, the CARB developed the first Scoping Plan in 2008 to outline the State's strategy to achieve 1990 level emissions by year 2020. In May 2014, the CARB released and adopted the *First Update to the Climate Change Scoping Plan* to identify the next steps in reaching AB 32 goals and evaluate the progress that has been made between 2000 and 2012. A newer version of the Scoping Plan was then adopted by the CARB in December 2017 (entitled *California's 2017 Climate Change Scoping Plan*). Lastly, the most recent version of the Scoping Plan was adopted by the CARB in November 2022 (entitled *Final 2022 Scoping Plan for Achieving Carbon Neutrality*) (2022 Scoping Plan), which was designed consistent with the long-term GHG reduction targets embedded in AB 1279. Since adoption of the 2008 Scoping Plan and the subsequent updates in 2014, 2017, and 2022, State agencies have adopted programs identified in the plan, and the Legislature has passed additional legislation to achieve the GHG reduction targets. Statewide strategies to reduce GHG emissions include the Low Carbon Fuel Standard, California Appliance

[2] The San Joaquin COG region was assigned reduction targets of 12% by 2020 and 16% by 2035.

Energy Efficiency regulations, California Building Standards (e.g., CALGreen and the 2022 Building and Energy Efficiency Standards), zero carbon electricity by 2045, and changes in the corporate average fuel economy standards (e.g., Pavley I and California Advanced Clean Cars).

SB 605 AND SB 1383

SB 605 (2014) required CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants in the state, and SB 1383 (2016) required CARB to approve and implement that strategy by January 1, 2018. SB 1383 also establishes specific targets for the reduction of short-lived climate pollutants (40% below 2013 levels by 2030 for methane and HFCs, and 50% below 2013 levels by 2030 for anthropogenic black carbon), and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, CARB adopted its Short-Lived Climate Pollutant Reduction Strategy (Reduction Strategy) in March 2017. The Reduction Strategy establishes a framework for the statewide reduction of emissions of black carbon, methane, and fluorinated gases.

ASSEMBLY BILL 1757

AB 1757 (September 2022) requires the California Natural Resources Agency (CNRA) to determine a range of targets for natural carbon sequestration, and for nature-based climate solutions that reduce GHG emissions for future years 2030, 2038, and 2045. These targets are to be determined by no later than January 1, 2024, and are established to support the state’s goals to achieve carbon neutrality and foster climate adaptation and resilience.

Building Code Requirements Intended to Reduce GHG Emissions

CALIFORNIA ENERGY CODE

The California Energy Code (CCR Title 24, Part 6), which is incorporated into the Building Energy Efficiency Standards, was first established in 1978 in response to a legislative mandate to reduce California's energy consumption. Although these standards were not originally intended to reduce GHG emissions, increased energy efficiency results in decreased GHG emissions because energy efficient buildings require less electricity and thus less consumption of fossil fuels, which emit GHGs. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.

The most recent Title 24 standards are the 2022 Title 24 standards. Buildings permitted on or after January 1, 2023, must comply with the 2022 Standards. The California Energy Commission updates the standards every three years. The CEC estimates that the 2022 Title 24 standards will reduce 10 million metric tons of GHG over 30 years. When compared to the 2019 Title 24 standards, the 2022 update focuses on: encouraging electric heat pump technology and use; establishing electric-ready requirements when natural gas is installed; expanding solar photovoltaic (PV) system and battery storage standards; and strengthening ventilation standards to improve indoor air quality.

CALIFORNIA GREEN BUILDING STANDARDS CODE

The purpose of the California Green Building Standards Code (CalGreen) (CCR Title 24, Part 11) is to improve public health and safety and to promote the general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices in the following categories: 1) planning and design; 2) energy efficiency; 3) water efficiency and conservation; 4) material conservation and resource efficiency; and 5) environmental quality. CalGreen, which became effective on January 1, 2011, instituted mandatory minimum environmental performance standards for all ground-up new construction of commercial, low-rise residential uses, and State-owned buildings, as well as schools and hospitals. The mandatory standards require the following:

- 20 percent mandatory reduction in indoor water use relative to baseline levels;
- 50 percent construction/demolition waste must be diverted from landfills;
- Mandatory inspections of energy systems to ensure optimal working efficiency; and
- Low-pollutant emitting exterior and interior finish materials such as paints, carpets, vinyl flooring, and particle boards.

The voluntary standards require the following:

- Tier I: 15 percent improvement in energy requirements, stricter water conservation requirements for specific fixtures, 65 percent reduction in construction waste, 10 percent recycled content, 20 percent permeable paving, 20 percent cement reduction, and cool/solar reflective roof.
- Tier II: 30 percent improvement in energy requirements, stricter water conservation requirements for specific fixtures, 75 percent reduction in construction waste, 15 percent recycled content, 30 percent permeable paving, 30 percent cement reduction, and cool/solar reflective roof.

The latest version of CalGreen is the 2022 CalGreen Code, which became effective on January 1, 2023. Between 2010 and 2022, continuous updates and additions have been made to CALGreen, including water conservation and recycling, electric vehicle infrastructure and charging, and changes intended to eliminate conflicts with the California Energy Code, which is Part 6 of Title 24.

TITLE 20

CCR Title 20 requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. The CEC certifies an appliance based on a manufacturer's demonstration that the appliance meets the standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwaters; clothes washers and dryers; cooking products; electric motors; low-voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing each type of appliance covered under the regulations, and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: federal and state standards for federally regulated appliances, state standards for federally regulated appliances, and state standards for non-federally regulated appliances.

SOLID WASTE

AB 939, AB 341, and AB 1826. In 1989, AB 939, known as the Integrated Waste Management Act (PRC Sections 40000 et seq.), was passed because of the increase in waste stream and the decrease in landfill capacity. The statute established the California Integrated Waste Management Board, which oversees a disposal reporting system. AB 939 mandated a reduction of waste being disposed where jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by 2000.

AB 341 (Chapter 476, Statutes of 2011 [Chesbro]) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by 2020, and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the state's policy goal (CalRecycle, 2012).

AB 1826 (Chapter 727, Statutes of 2014, effective 2016) requires businesses to recycle their organic waste (i.e., food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste) depending on the amount of waste they generate per week. This law also requires local jurisdictions across the state to implement an organic waste recycling program to divert organic waste generated by businesses, including multifamily residential dwellings that consist of five or more units. The minimum threshold of organic waste generation by businesses subject to the law decreases over time, which means an increasingly greater proportion of the commercial sector will be required to comply.

REGIONAL

PG&E adopted the 2020 Integrated Resource Plan (IRP) on September 1, 2020, to provide guidance for serving the electricity and natural gas needs of residents and businesses within its service area while fulfilling regulatory requirements. The IRP contains the following objectives that are relevant to the Project:

- Clean Energy: In 2021, PG&E delivered nearly 50 percent of its electricity from RPS-eligible renewable resources, such as solar, wind, geothermal, biomass, and small hydropower. In addition, PG&E's GHG-free energy production, which encompasses renewable resources, large hydropower, and nuclear, satisfied all of PG&E's bundled retail sales in 2021.

- Reliability: PG&E's IRP analysis includes PG&E's contribution to system and local reliability, in compliance with the CPUC's resource adequacy requirements, especially as California transitions toward higher shares of GHG-free generation resources.
- Affordability: PG&E's IRP analysis selects resources to meet the state's clean energy and reliability goals and provides a system average rate forecast in compliance with the CPUC's requirements for investor-owned utilities.

SAN JOAQUIN AIR POLLUTION CONTROL DISTRICT

Climate Change Action Plan

On August 21, 2008, the Valley Air District Governing Board approved a proposal called the Climate Change Action Plan (CCAP). The CCAP began with a public process bringing together stakeholders, land use agencies, environmental groups, and business groups to conduct public workshops to develop comprehensive policies for CEQA Guidelines, a carbon exchange bank, and voluntary GHG emissions mitigation agreements for the Governing Board's consideration. The CCAP contains the following goals and actions:

- Develop GHG significance thresholds to address CEQA projects with GHG emission increases.
- Develop the San Joaquin Valley Carbon Exchange for banking and trading GHG reductions.
- Authorize use of the SJVAPCD [Valley Air District's] existing inventory reporting system to allow use for GHG reporting required by AB 32 regulations.
- Develop and administer GHG reduction agreements to mitigate proposed emission increases from new projects.
- Support climate protection measures that reduce GHG emissions as well as toxic and criteria pollutants. Oppose measures that result in a significant increase in toxic or criteria pollutant emissions in already impacted areas.

Rule 2301

While the CCAP indicated that the GHG emission reduction program would be called the San Joaquin Valley Carbon Exchange, the Valley Air District incorporated a method to register voluntary GHG emission reductions into its existing Rule 2301-Emission Reduction Credit Banking through amendments of the rule. Amendments to the rule were adopted on January 19, 2012. The purposes of the amendments to the rule include the following:

- Provide an administrative mechanism for sources to bank voluntary GHG emission reductions for later use.
- Provide an administrative mechanism for sources to transfer banked GHG emission reductions to others for any use.
- Define eligibility standards, quantitative procedures, and administrative practices to ensure that banked GHG emission reductions are real, permanent, quantifiable, surplus, and enforceable.

LOCAL

City of Lathrop General Plan

The City of Lathrop General Plan includes several policies and actions that are relevant to GHGs, climate change, and energy. General Plan policies and actions applicable to the Project are identified below:

POLICIES: LAND USE ELEMENT

Policy LU-3.1 Support regional efforts that promote higher densities and intensities near major transit and travel facilities, and reduce regional vehicle miles traveled by supporting active modes of transportation including walking, biking, and public transit.

Policy LU-3.2 Utilize planning tools and objectives that promote transit-oriented and mixed-use development objectives near future ACE and Valley Link Transit Facilities. Land use plans for these areas should complement transit facilities to accommodate transit oriented development (TOD) developments and/or park-and-ride facilities near ACE stations and future Valley Link station.

Policy LU-3.3 Integrate climate change and adaptation planning principles into future updates of the Zoning Code, and other related long-range utilities and facilities planning documents. (See the Safety Element for additional policies related to climate change and resiliency planning).

Policy LU-3.4 Promote logical City boundaries and work with surrounding jurisdictions to encourage complementary uses. Specifically, work with the City of Manteca and San Joaquin County to ensure development of complementary and compatible uses adjacent to Lathrop.

Policy LU-4.2 Emphasize efforts to reduce regional vehicle miles traveled (VMT) by supporting land use patterns and site designs that promote active modes of transportation, and public transit.

Policy LU-4.4 As the city grows, encourage and support the development of a transit system with regular service connecting destinations within the city, to ACE and Valley Link stations, and to adjacent jurisdictions.

Policy LU-5.1 Require new development to be compatible and complementary to existing development. Where appropriate and feasible, promote connections between neighborhoods and services and facilities.

ACTIONS: LAND USE ELEMENT

Action LU-3.b Work with adjacent jurisdictions to facilitate increased compatibility and access across barriers to travel such as discontinuous streets, bike lanes, sidewalks, and paths.

Action LU-3.c Work with developers, reclamation districts and utility providers to create or expand linear parks, trails, and publicly-accessible greenways along levees, drainage and utility rights-of-way that provide opportunities for greenway connections and passive recreational opportunities.

Action LU-5b Through the development review process, analyze land use compatibility and require adequate buffers and/or architectural enhancements to protect sensitive receptors from intrusion of development activities that may cause unwanted nuisances and health risks.

POLICIES: CIRCULATION ELEMENT

Policy CIR-1.2 Complete Streets. Consider all modes of travel in planning, design, and construction of all transportation projects to create safer, more livable, and more inviting environments for pedestrians, bicyclists, motorists and public transit users of all ages and capabilities.

Policy CIR-2.1 Bicycle and Pedestrian Networks. Establish a network of identified bicycle and pedestrian routes connecting residential areas with schools, recreation, shopping, and employment areas within the City.

Policy CIR-2.3 Safe Routes to School. Consider walking and bicycling school access as a priority over vehicular movements when any such conflicts occur.

Policy CIR-2.4 Transit Access. Provide safer, more convenient access to transit service including rail, bus, and paratransit.

Policy CIR-2.5 Amenities. To support bicycle, pedestrian, and transit usage, provide amenities including pedestrian-scale lighting, bicycle parking, shade trees and landscaping, and bus shelters and benches.

Policy CIR-4.1 Land Use Supporting Reduced VMT. Support land use with increased land use densities and mixed uses, consistent with the Land Use Element, to reduce vehicle miles traveled and promote the use of walking, biking, and transit.

Policy CIR-4.2 Demand Management. Encourage employers to provide programs for carpooling/transit/biking/walking, transit ridership subsidies, bicycle facilities, alternative work schedules, ridesharing, telecommuting, working at home, employee education, and preferential parking for carpools/vanpools.

Policy CIR-4.3 New Technologies. Monitor deployment of new transportation technologies and services and develop policies that implement best practices to ensure these technologies and services benefit the public and the multimodal transportation system.

Policy CIR-4.4 Electric Vehicle Charging. Support the creation of electric vehicle charging stations at multifamily residential, commercial, government, and other employment and community destinations.

ACTIONS: CIRCULATION ELEMENT

Action CIR-1b Require development projects to arrange streets in an interconnected pattern, so that pedestrians, bicyclists, and drivers are not forced onto arterial streets for inter- or intra-neighborhood travel. This approach will also increase the safety and efficiency of movement of emergency responders and reduce vehicle miles traveled within the community.

Action CIR-1c Apply signals, roundabouts, traffic circles and other traffic management techniques appropriately at residential and collector street intersections with collector and arterial streets in order to allow bicyclists and pedestrians to travel more conveniently and more safely from one neighborhood to another.

Action CIR-1d Use traffic calming tools to assist in implementing complete street principles; possible tools include roundabouts, raised intersections, curb extensions, reduced roadway width, and high visibility crosswalks.

Action CIR-2a Create an active transportation plan supporting the development of bicycle and pedestrian networks across the City and funding applications for bicycle and pedestrian improvements.

Action CIR-2b Add planned bicycle and pedestrian facilities in conjunction with road rehabilitation, reconstruction, or re-striping projects whenever feasible.

Action CIR-2c Enhance sidewalks to create a high-quality pedestrian environment, including wider sidewalks and improved pedestrian crossings, landscaping, buffers between sidewalks and vehicle travel lanes, enhanced pedestrian lighting, wayfinding signage, shade trees, and canopies, increased availability of benches, and other features.

Action CIR-2d Improve bicycle facilities to include attractive and secure bicycle parking, bicycle lanes, bike paths, and wayfinding signage along appropriate roadways.

Action CIR-2e Encourage and support the enhancement of transit stops with high quality, well-maintained shelters, and provision of wayfinding signage and transit timetables.

Action CIR-2f Provide access for bicycles and pedestrians at the ends of cul-de-sacs and through walls and berms, where right-of-way is available, to provide convenient access within and between neighborhoods and to encourage walking and bicycling to neighborhood destinations.

Action CIR-2g Ensure that development and infrastructure projects are designed to provide pedestrian and bicycle access and leave no gaps in the bicycle and pedestrian networks.

Action CIR-2h Require new development to provide bicycle parking and shower and locker facilities at commercial, business/professional and light industrial uses in accordance with the California Green Building Standards Code. Encourage existing uses to provide such facilities.

Action CIR-2j Create an off-street shared-use path system for use by pedestrians and bicyclists for transportation and recreation.

Action CIR-2k Create bicycle and pedestrian connections to adjacent jurisdictions via shared use paths, bikeways, and sidewalks.

Action CIR-2l Create bicycle and pedestrian connections to the ACE station, planned Valley Link stations, and other transit stops.

Action CIR-2m Encourage transit providers to improve passenger pick-up and drop-off areas at the ACE and planned Valley Link stations to provide more convenient access.

Action CIR-2n Partner with neighboring jurisdictions and regional transit providers (including San Joaquin Regional Transit District, Manteca Transit, and Tracy TRACER Bus Services) to expand transit service between Lathrop and destinations in other jurisdictions.

Action CIR-2o Coordinate with transit providers and encourage them to enhance transit amenities for safe and comfortable access to transit including waiting areas, seating, landscaping, lighting, shade and rain cover, trash receptacles, and passenger loading zones.

Action CIR-4a Refine and update the City of Lathrop interim VMT thresholds and screening criteria to reflect the updated VMT analysis completed for the General Plan update if such updates are deemed necessary or warranted.

Action CIR-4b Evaluate the feasibility of a local or regional VMT impact fee program, bank, or exchange. Such an offset program, if determined feasible, would be administered by the City or a City-approved agency, and would offer demonstrated VMT reduction strategies through transportation demand management programs, impact fee programs, mitigation banks or exchange programs, in-lieu fee programs, or other land use project conditions that reduce VMT in a manner consistent with state guidance on VMT reduction. If, through on-site changes, a subject project cannot eliminate VMT impacts, the project could contribute on a pro-rata basis to a local or regional VMT reduction bank or exchange, as necessary, to reduce net VMT impacts.

Action CIR-4c Require proposed development projects that could have a potentially significant VMT impact to consider reasonable and feasible project modifications and other measures during the project design and environmental review stage of project development that would reduce VMT effects in a manner consistent with state guidance on VMT reduction.

Action CIR-4e Partner with SJCOG on the Dibs program, which is the regional smart travel program, including rideshare, transit, walking, and biking.

Action CIR-4f As new transportation technologies and mobility services, including autonomous vehicles, electric vehicles, electric bicycles and scooters, and transportation network companies (e.g., Uber and Lyft) are implemented and used by the public, review and update City policies and plans to maximize the benefit to the public of such technologies and services without adversely affecting the City's transportation network. Updates to the City's policies and plans may cover topics such as electric vehicle charging stations, curb space management, changes in parking supply requirements, policies regarding electric scooter use, etc.

Action CIR-4j As need for transit grows, review and consider alternatives to conventional bus systems, such as smaller shuttle buses (micro-transit), on-demand transit services, or transportation networking company services that connect neighborhood centers to local activity centers with greater cost efficiency.

Action CIR-4k Require new development to incorporate electric vehicle charging in accordance with the California Green Building Standards Code. Encourage installation of electric vehicle charging stations at existing development.

POLICIES: RECREATION AND RESOURCES ELEMENT

Policy RR-6.1 Regional Standards. Coordinate planning efforts with the San Joaquin Valley Air Pollution Control District (SJVAPCD), San Joaquin Council of Governments, and the California Air Resource Board to meet local and regional air quality standards and ensure attainment of established goals.

Policy RR-6.2 Sensitive Receptors. Minimize the community's exposure to toxic and harmful air emissions and odors by requiring an adequate buffer or distance between residential and other sensitive receptors and industrial-type uses that typically generate air pollutants, toxic air contaminants, and/or obnoxious fumes or odors.

Policy RR-6.3 Construction Activities. Require new construction to minimize fugitive dust and construction vehicle emissions.

Policy RR-6.4 Development. Encourage the development of mixed-use residential opportunities and live-work environments within the City to lessen the impacts of traffic congestion on local air quality.

Policy RR-6.5 Appliances and Equipment. Require appliances and equipment, including wood-burning devices, in development projects to meet current standards for controlling air pollution, including particulate matter and toxic air contaminants.

Policy RR-6.6 Combustible Materials. Cooperate with the Air District to ensure that burning of any combustible material within the City is consistent with Air District regulations to minimize particulate air pollution.

Policy RR-6.7 Mitigation. Require the implementation of relevant mitigation measures for all future development upon identification of potential air quality impacts.

Policy RR-6.8 Local Reduction Targets. The City of Lathrop establishes the following per capita GHG reduction targets, in order to meet the requirements established by the state under AB 32 and SB 32, consistent with the CARB's 2017 Scoping Plan:

A. 3.99 MT CO_2e per capita by 2030

B. 2.66 MT CO_2e per capita by 2040; and

C. 1.33 MT CO_2e per capita by 2050.

Policy RR-6.9 GHG Reduction. Consider, and implement as feasible, new policies and programs that will help to provide energy efficient alternatives to fossil fuel use and reduce consumption in order to reduce greenhouse gas emissions.

Policy RR-6.10 Public Engagement. Promote regional air quality programs to inform the public on regional air quality concerns and encourage the engagement of all Lathrop residents in future planning decisions related to air quality.

ACTIONS: RECREATION AND RESOURCES ELEMENT

Action RR-6a Review development, infrastructure, and planning projects for consistency with SJVAPCD requirements during the CEQA review process. Require project applicants to prepare air quality analyses to address SJVAPCD and General Plan requirements, which include analysis and identification of:

A. Air pollutant emissions associated with the project during construction, project operation, and cumulative conditions.

B. Potential exposure of sensitive receptors to toxic air contaminants.

C. Significant air quality impacts associated with the project for construction, project operation, and cumulative conditions.

D. Mitigation measures to reduce significant impacts to less than significant or the maximum extent feasible where impacts cannot be mitigated to less than significant.

Action RR-6b Review all new industrial and commercial development projects for potential air quality impacts to residences and other sensitive receptors. Ensure that mitigation measures and best management practices are implemented to reduce significant emissions of criteria pollutants.

Action RR-6c Work with SJCOG and the SJVAPCD to implement plans and programs aimed at improving regional air quality.

Action RR-6d Continue to review development projects to ensure that all new public and private development complies with the California Code of Regulations (CCR), Title 24 standards as well as the energy efficiency standards established by the Lathrop Municipal Code.

Action RR-6e Monitor GHG emissions generated by the community over time for consistency with the established GHG reduction targets, and update the City's community GHG Inventory every five years. In the event that the City determines that ongoing efforts to reduce GHG emissions are not on track to meet the City's adopted GHG reduction targets, the City shall establish and adopt new and/or revised GHG reductions measures that will effectively meet the established GHG reduction targets.

Action RR-6f Continue the expansion of infrastructure to facilitate the use of City-owned low or zero emission vehicles such as electric vehicle charging facilities and conveniently located alternative fueling stations at key City facilities as operations necessitate and/or as funding becomes available.

Action RR-6g Evaluate and consider multi-modal transportation benefits to all City employees, such as free or low-cost monthly transit passes. Encourage employer participation in similar programs. Encourage new transit/shuttle services and use.

Action RR-6h Encourage community car-sharing and carpooling.

Action RR-6i Support the establishment and expansion of a regional network of electric vehicle charging stations and encourage the expanded use of electric vehicles.

Action RR-6j Establish and adopt standards and requirements for electric vehicle parking, including minimum requirements for the installation of electric vehicle charging stations in new multi-family residential and commercial, office, and light industrial development.

Action RR-6k Consider instituting a Green Building Program to reflect best practices, such as encouraging the use of cement substitutes and recycled building materials for new construction.

Action RR-6l Continue cooperating with the SJVAPCD by requiring a dust management plan to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard prior to construction and grading.

3.7.3 IMPACTS AND MITIGATION MEASURES

GREENHOUSE GAS EMISSIONS THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, climate change-related impacts are considered significant if implementation of the proposed Project would do any of the following:

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Most individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence to climate change; therefore, the issue of climate change typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15355).

For individual proposed projects, the significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds, or consistency with a regional GHG reduction plan (such as a Climate Action Plan). The City of Lathrop does not have a formal GHG emissions reduction plan (or any other form of a Climate Action Plan).

Therefore, the Project is assessed based on its consistency with the CARB's latest adopted Scoping Plan, including the Project's compliance with relevant Scoping Plan measures, as well as the latest RTP/SCS for the region within which the Project is located within (i.e., the San Joaquin Council of

Governments' 2022 RTP/SCS). It should be noted that the Scoping Plan is consistent with the AB 1279 GHG reduction targets of achieving carbon neutrality by 2045, and reducing anthropogenic emissions to 85 percent below 1990 levels by 2045. Therefore, consistency with the CARB's most recent Scoping Plan would also demonstrate consistency with the carbon neutrality requirements encapsulated by AB 1279.

This analysis provides a qualitative assessment of the Project's compliance with the applicable plans, policies, and regulations for the purposes of reducing greenhouse gas emissions to determine whether the project would have a significant impact on the environment relative to GHGs. Separately, disclosure of the Project's estimated construction and operation-related GHG emissions are provided for the purposes of disclosure.[3]

THRESHOLDS OF SIGNIFICANCE (ENERGY CONSERVATION)

Consistent with Appendices F and G of the CEQA Guidelines, energy-related impacts are considered significant if implementation of the proposed Project would do the following:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation;
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

To determine whether the proposed Project would result in a significant impact on energy use, this EIR includes an analysis of proposed Project energy use, as provided under *Impacts and Mitigation Measures* below.

IMPACTS AND MITIGATION MEASURES

Impact 3.7-1: Project implementation would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment and would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (Less than Significant)

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. A project's GHG emissions are at a micro-scale relative to global emissions, but could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. Implementation of the Project would contribute to increases of GHG emissions that are associated with global climate change. Estimated GHG emissions attributable to Project

[3] Project GHG emissions were provided using the latest version of CalEEMod (v2022.1), which represents the Air District's recommended modeling tool for estimating emissions for projects under CEQA.

development would be primarily associated with increases of CO_2 and other GHG pollutants, such as methane (CH_4) and nitrous oxide (N_2O), from mobile sources and utility usage.

The Project's short-term construction-related and long-term operational GHG emissions were estimated using the California Emission Estimator Model (CalEEMod)™ (v.2022.1). CalEEMod is a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify GHG emissions from land use projects. The model quantifies direct GHG emissions from construction and operation (including vehicle use), as well as indirect GHG emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Emissions are expressed in annual metric tons of CO_2 equivalent units of measure (i.e., MT CO_2e), based on the global warming potential of the individual pollutants.

STATEWIDE GHG REDUCTION MEASURES THAT APPLY TO THE PROJECT

Several statewide GHG reduction strategies apply to the Project either directly or indirectly. A summary of these strategies is provided in Table 3.7-2, below.

TABLE 3.7-2: SUMMARY OF STATEWIDE GHG REDUCTION STRATEGIES THAT APPLY TO THE PROJECT

PROJECT COMPONENT	*APPLICABLE LAWS/REGULATIONS*	*GREENHOUSE GAS REDUCTION MEASURES REQUIRED FOR PROJECT*
BUILDING COMPONENTS / FACILITY OPERATIONS		
Roofs/Ceilings/ Insulation	CAL Green Code (Title 24, Part 11) California Energy Code (Title 24, Part 6)	The Project must comply with efficiency standards regarding roofing, ceilings, and insulation. For example: Roofs/Ceilings: New construction must reduce roof heat island effects per CALGreen Code Section 106.11.2, which requires use of roofing materials having a minimum aged solar reflectance, thermal emittance complying with Sections A5.106.11.2.2 and A5.106.11.2.3, or a minimum aged Solar Reflectance Index as specified in Table A5.106.11.2.2 or A5.106.11.2.3. Roofing materials must also meet solar reflectance and thermal emittance standards contained in Title 20 Standards. Roof/Ceiling Insulation: Requirements for the installation of roofing and ceiling insulation (see Title 24, Part 6 Compliance Manual at Section 3.2.2).
Flooring	CALGreen Code	The Project must comply with efficiency standards regarding flooring materials. For example, for 80% of floor area receiving "resilient flooring," the flooring must meet applicable installation and material requirements contained in CALGreen Code Section 5.504.4.6.
Window and Doors	California Energy Code	The Project must comply with fenestration efficiency requirements. For example, the choice of windows, glazed doors, and any skylights for the Project must conform to energy consumption requirements affecting

Project Component	*Applicable Laws/Regulations*	*Greenhouse Gas Reduction Measures Required for Project*
		size, orientation, and types of fenestration products used (see Title 24, Part 6 Compliance Manual, Section 3.3).
Building Walls/ Insulation	CALGreen Code California Energy Code	The Project must comply with efficiency requirements for building walls and insulation. Exterior Walls: Must meet requirements in the current edition of the California Energy Code and comply with Section A5.106.7.1 or A5.106.7.2 of CALGreen for wall surfaces, as well as Section 5.407.1, which requires weather-resistant exterior wall and foundation envelope as required by California Building Code Section 1403.2. Construction must also meet requirements contained in Title 24, Part 6, which vary by material of the exterior walls (see Title 24, Part 6 Compliance Manual, Part 3.2.3). Demising (Interior) Walls: Mandatory insulation requirements for demising walls (which separate conditioned from non-conditions space) differ by the type of wall material used (Title 24, Part 6 Compliance Manual Part 3.2.4). Door Insulation: Mandatory requirements for air infiltration rates to improve insulation efficiency; they differ according to the type of door (Title 24, Part 6 Compliance Manual Part 3.2.5). Flooring Insulation: Mandatory requirements for insulation that depend on the material and location of the flooring (Title 24, Part 6 Compliance Manual Part 3.2.6).
Finish Materials	CALGreen	The Project must comply with pollutant control requirements for finish materials. For example, materials including adhesives, sealants, caulks, paints and coatings, carpet systems, and composite wood products must meet requirements in CALGreen to ensure pollutant control (CALGreen Section 5.504.4).
Wet Appliances (Toilets/Faucets/Urinal, Dishwasher/Clothes Washer, Spa and Pool/Water Heater)	CALGreen, California Energy Code, Appliance Efficiency Regulations (Title 20 Standards)	Wet appliances associated with the Project must meet various efficiency requirements. For example: Pool: Use associated with the Project is subject to appliance efficiency requirements for service water heating systems and equipment and spa and pool heating systems and equipment (Title 24, Part 6, Sections 110.3, 110.4, 110.5; Title 20 Standards, Sections 1605.1(g), 1605.3(g); see also California Energy Code). Toilets/Faucets/Urinals: Use associated with the Project is subject to new maximum rates for toilets, urinals, and faucets effective January 1, 2016 (Title 20 Standards,

PROJECT COMPONENT	*APPLICABLE LAWS/REGULATIONS*	*GREENHOUSE GAS REDUCTION MEASURES REQUIRED FOR PROJECT*
		Sections 1605.1(h),(i) 1065.3(h),(i)): ■ Showerheads maximum flow rate 2.5 gallons per minute (gpm) at 80 pounds per square inch (psi) ■ Wash fountains 2.2 x (rim space in inches/20) gpm at 60 psi ■ Metering faucets 0.25 gallons per cycle ■ Lavatory faucets and aerators 1.2 gpm at 60 psi ■ Kitchen faucets and aerators 1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi ■ Public lavatory faucets 0.5 gpm at 60 psi ■ Trough-type urinals 16 inches length ■ Wall mounted urinals 0.125 gallons per flush ■ Other urinals 0.5 gallons per flush Water Heaters: Use associated with the Project is subject to appliance efficiency requirements for water heaters (Title 20 Standards, Sections 1605.1(f), 1605.3(f)). Dishwasher/Clothes Washer: Use associated with the Project is subject to appliance efficiency requirements for dishwashers and clothes washers (Title 20 Standards, Sections 1605.1(o),(p),(q), 1605.3(o),(p),(q)).
Dry Appliances (Refrigerator/Freezer, Heater/Air Conditioner, Clothes Dryer)	Title 20 Standards CALGreen Code	Dry appliances associated with the Project must meet various efficiency requirements. For example: Refrigerator/Freezer: Use associated with the Project is subject to appliance efficiency requirements for refrigerators and freezers (Title 20 Standards, Sections 1605.1(a), 1605.3(a)). Heater/Air Conditioner: Use associated with the Project is subject to appliance efficiency requirements for heaters and air conditioners (Title 20 Standards, Sections 1605.1(b),(c),(d),(e), 1605.3(b),(c),(d),(e) as applicable). Clothes Dryer: Use associated with the Project is subject to appliance efficiency requirements for clothes dryers (Title 20 Standards, Section 1605.1(q)).
	CALGreen Code	Installations of heating, ventilation, and air conditioning; refrigeration and fire suppression equipment must comply with CALGreen Sections 5.508.1.1 and 508.1.2,

PROJECT COMPONENT	*APPLICABLE LAWS/REGULATIONS*	*GREENHOUSE GAS REDUCTION MEASURES REQUIRED FOR PROJECT*
		which prohibits CFCs, halons, and certain HCFCs and HFCs.
Lighting	Title 20 Standards	Lighting associated with the Project are subject to energy efficiency requirements contained in Title 20 Standards. <u>General Lighting</u>: Indoor and outdoor lighting associated with the Project must comply with applicable appliance efficiency regulations (Title 20 Standards, Sections 1605.1(j),(k),(n), 1605.3(j),(k),(n)). <u>Emergency Lighting and Self-Contained Lighting</u>: Project must also comply with applicable appliance efficiency regulations (Title 20 Standards, Sections 1605.1(l), 1605.3(l)). Emergency Lighting and Self-Contained Lighting: Project must also comply with applicable appliance efficiency regulations (Title 20 Standards, Sections 1605.1(l), 1605.3(l)). <u>Traffic Signal Lighting</u>: For any necessary Project improvements involving traffic lighting, traffic signal modules and traffic signal lamps will need to comply with applicable appliance efficiency regulations (Title 20 Standards, Sections 1605.1(m), 1605.3(m)).
	California Energy Code	Lighting associated with the Project will also be subject to energy efficiency requirements contained in Title 24, Part 6, which contains energy standards for non-residential indoor lighting and outdoor lighting (see Title 24 Part 6 Compliance Manual, at Sections 5, 6). Mandatory lighting controls for indoor lighting include, for example, regulations for automatic shut-off, automatic daytime controls, demand responsive controls, and certificates of installation (Title 24 Part 6 Compliance Manual at Section 5). Regulations for outdoor lighting include, for example, creation of lighting zones, lighting power requirements, a hardscape lighting power allowance, requirements for outdoor incandescent and luminaire lighting, and lighting control functionality (Title 24 Part 6 Compliance Manual Section 6).
	AB 1109	Lighting associated with the Project will be subject to energy efficiency requirements adopted pursuant to AB 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general purpose lighting to reduce electricity consumption 25% for indoor

PROJECT COMPONENT	*APPLICABLE LAWS/REGULATIONS*	*GREENHOUSE GAS REDUCTION MEASURES REQUIRED FOR PROJECT*
		commercial lighting.
Bicycle and Vehicle Parking	CALGreen Code	The Project will be required to provide compliant bicycle parking, fuel-efficient vehicle parking, and electric vehicle (EV) charging spaces (CALGreen Code Sections 5.106.4, 5.106.5.1, 5.106.5.3).
	California Energy Code	The Project is subject to parking requirements contained in Title 24, Part 6. For example, parking capacity is to meet but not exceed minimum local zoning requirements, and the Project should employ approved strategies to reduce parking capacity (Title 24, Part 6, Section 106.6).
Landscaping	CALGreen Code	CALGreen requires and has further voluntary provisions for the following: ■ A water budget for landscape irrigation use ■ For new water service, separate meters or submeters must be installed for indoor and outdoor potable water use for landscaped areas of 1,000 to 5,000 square feet ■ Provide water-efficient landscape design that reduces use of potable water beyond initial requirements for plant installation and establishment
	Model Water Efficient Landscaping Ordinance	The model ordinance promotes efficient landscaping in new developments and establishes an outdoor water budget for new and renovated landscaped areas that are 500 square feet or larger (CCR, Title 23, Division 2, Chapter 2.7).
Refrigerants	CARB Management of High GWP Refrigerants for Stationary Sources	Any refrigerants associated with the Project would be subject to CARB standards. CARB's Regulation for the Management of High GWP Refrigerants for Stationary Sources reduces emissions of high-GWP refrigerants from leaky stationary, non-residential refrigeration equipment; reduces emissions resulting from the installation and servicing of stationary refrigeration and air conditioning appliances using high-GWP refrigerants; and requires verification GHG emission reductions (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5.1, Section 95380 et seq.).
Consumer Products	CARB High GWP GHGs in Consumer Products	All consumer products associated with the Project will be subject to CARB standards. CARB's consumer products regulations set VOC limits for numerous categories of consumer products, and limits the reactivity of the ingredients used in numerous categories of aerosol coating products (CCR, Title 17, Division 3, Chapter 1,

Project Component	*Applicable Laws/Regulations*	*Greenhouse Gas Reduction Measures Required for Project*
		Subchapter 8.5).
Construction		
Use of Off-Road Diesel Engines, Vehicles, and Equipment	CARB In-Use Off-Road Diesel Vehicle Regulation	Any relevant vehicle or machine use associated with the Project will be subject to CARB standards. The CARB In-Use-Off-Road Diesel Vehicle Regulation applies to certain off-road diesel engines, vehicles, or equipment greater than 25 horsepower. The regulation imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles; requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; restricts the adding of older vehicles into fleets starting on January 1, 2014; and requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits). The requirements and compliance dates of the Off-Road Regulation vary by fleet size, as defined by the regulation.
Greening New Construction	CALGreen Code	All new construction, including the Project, must comply with CALGreen, as discussed in more detail throughout this table. Adoption of the mandatory CALGreen standards for construction has been essential for improving the overall environmental performance of new buildings; it also sets voluntary targets for builders to exceed the mandatory requirements.
Construction Waste	CALGreen Code	The Project would be subject to CALGreen requirements for construction waste reduction, disposal, and recycling, such as a requirement to recycle and/or salvage for reuse a minimum of 50% of the non-hazardous construction waste in accordance with Section 5.408.1.1, 5.408.1.2, or 5.408.1.3, or meet a local construction and demolition waste management ordinance, whichever is more stringent.
Solid Waste		
Solid Waste Management	Landfill Methane Control Measure	Waste associated with the Project would be disposed of per state requirements for landfills, material recovery facilities, and transfer stations. Per the statewide GHG emissions inventory, the largest emissions from waste management sectors come from landfills and are in the form of methane (CH_4). In 2010, CARB adopted a regulation that reduces emissions from CH_4 in landfills, primarily by requiring owners and operators of certain uncontrolled municipal solid waste landfills to install gas collection and control

Project Component	*Applicable Laws/Regulations*	*Greenhouse Gas Reduction Measures Required for Project*
		systems, and requires existing and newly installed gas and control systems to operate in an optimal manner. The regulation allows local air districts to voluntarily enter into a memorandum of understanding with CARB to implement and enforce the regulation and to assess fees to cover costs of implementation.
	Mandatory Commercial Recycling (AB 341)	AB 341 will require the Project, if it generates 4 cubic yards or more of commercial solid waste per week, to arrange for recycling services using one of the following: self-haul, subscribe to a hauler, arrange for pickup of recyclable materials, or subscribe to a recycling service that may include mixed waste processing that yields diversion results comparable to source separation. The Project will also be subject to local commercial solid waste recycling programs required to be implemented by each jurisdiction under AB 341.
	CALGreen Code	The Project will be subject to CALGreen requirements to provide areas that serve the entire building and are identified for depositing, storing, and collecting nonhazardous materials for recycling (CALGreen Code Section 5.410.1).
Energy Use		
Renewable Energy	California RPS (SB X1-2, SB 350, SB 100, and SB 1020)	Energy providers associated with the Project will be required to comply with the RPS set by SB X1 2, SB 350, and SB 100. SB X1 2 required investor-owned utilities, publicly owned utilities, and electric service providers to increase purchases of renewable energy such that at least 33% of retail sales are procured from renewable energy resources by December 31, 2020. In the interim, each entity was required to procure an average of 20% of renewable energy for the period of January 1, 2011 through December 31, 2013; and were required to procure an average of 25% by December 31, 2016, and 33% by 2020. SB 350 requires retail sellers and publicly owned utilities to procure 50% of their electricity from eligible renewable energy resources by 2030. SB 100 increased the standards set forth in SB 350 establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030, be secured from qualifying renewable energy sources. SB 100 states that it is the policy of the state that

Project Component	*Applicable Laws/Regulations*	*Greenhouse Gas Reduction Measures Required for Project*
		eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California by 2045. SB 1020 built on the standards set forth in SB 100, establishing that 90% of the retail sales of electricity must be carbon free by 2035, 95% must be carbon free by 2040, and, as stated in SB 100, 100% must be carbon free by 2045.
	California Solar Initiative-Thermal Program	Multifamily properties qualify for rebates of up to $800,000 on solar water heating systems and eligible solar pool heating systems qualify for rebates of up to $500,000. Funding for the California Solar Initiative – Thermal program comes from ratepayers of Pacific Gas & Electric, SCE, Southern California Gas Company, and San Diego Gas & Electric. The rebate program is overseen by the CPUC as part of the California Solar Initiative.
Vehicular/Mobile Sources		
General	SB 375 and RTP/SCS	The Project complies with, and is subject to, the SJCOG's RTP/SCS adopted in 2022, as shown in Table 3.7-6 below.
Fuel	Low Carbon Fuel Standard (LCFS)/ EO S-01-07	Auto trips associated with the Project will be subject to the Low Carbon Fuel Standard (EO S-01-07), which required a 10% or greater reduction in the average fuel carbon intensity by 2020 with a 2010 baseline for transportation fuels in California regulated by CARB. The program establishes a strong framework to promote the low carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG goals.
Automotive Refrigerants	CARB Regulation for Small Containers of Automotive Refrigerant	Vehicles associated with the Project will be subject to CARB's Regulation for Small Containers of Automotive Refrigerant (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 5, Section 95360 et seq.). The regulation applies to the sale, use, and disposal of small containers of automotive refrigerant with a GWP greater than 150. The regulation achieves emission reductions through implementation of four requirements: use of a self-sealing valve on the container, improved labeling instructions, a deposit and recycling program for small containers, and an education program that emphasizes best practices for vehicle recharging. This regulation went into effect on January 1, 2010, with a 1-year sell-through period for containers manufactured before January 1, 2010. The target recycle rate was initially set at 90%, and rose to 95% beginning January 1, 2012.

PROJECT COMPONENT	*APPLICABLE LAWS/REGULATIONS*	*GREENHOUSE GAS REDUCTION MEASURES REQUIRED FOR PROJECT*
Light-Duty Vehicles	AB 1493 (or the Pavley Standard)	Cars that drive to and from the Project will be subject to AB 1493, which directed CARB to adopt a regulation requiring the maximum feasible and cost-effective reduction of GHG emissions from new passenger vehicles. Pursuant to AB 1493, CARB adopted regulations that established a declining fleet average standard for CO2, CH4, N2O, and HFCs (air conditioner refrigerants) in new passenger vehicles and light-duty trucks beginning with the 2009 model year and phased-in through the 2016 model year. These standards were divided into those applicable to lighter and those applicable to heavier portions of the passenger vehicle fleet. The regulations will reduce “upstream” smog-forming emissions from refining, marketing, and distribution of fuel.
	Advanced Clean Car and ZEV Programs	Cars that drive to and from the Project will be subject to the Advanced Clean Car and ZEV Programs. In January 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles (ZEVs) into a single package of standards called Advanced Clean Cars. By 2025, new automobiles will emit 34% less global warming gases and 75% less smog-forming emissions. The ZEV Program will act as the focused technology of the Advanced Clean Cars Program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid EVs in the 2018–2025 model years. The Advanced Clean Cars II (ACC II) regulation builds on the Advanced Clean Cars (ACC) rule adopted in 2012. ACC II decreases emissions by increasing EV sales via two programs. First, the under the ZEV program, original equipment manufacturers (OEMs) must increase sales of ZEV vehicles from 35 percent in 2026 to 100 percent in 2035. Second, ACC II further strengthened the LEV program discussed above, with more stringent emission standards beginning with model year 2025.
	Tire Inflation Regulation	Cars that drive to and from the Project will be subject to the CARB Tire Inflation Regulation, which took effect on September 1, 2010, and applies to vehicles with a gross vehicle weight rating of 10,000 pounds or less. Under this regulation, automotive service providers must, inter alia, check and inflate each vehicle’s tires to the recommended tire pressure rating, with air or nitrogen, as

PROJECT COMPONENT	*APPLICABLE LAWS/REGULATIONS*	*GREENHOUSE GAS REDUCTION MEASURES REQUIRED FOR PROJECT*
		appropriate, at the time of performing any automotive maintenance or repair service, to keep a copy of the service invoice for a minimum of 3 years, and to make the vehicle service invoice available to the CARB or its authorized representative upon request.
	EPA and NHTSA GHG and CAFÉ standards.	Mobile sources that travel to and from the Project site would be subject to EPA and NHTSA GHG and CAFE standards for passenger cars, light-duty trucks, and medium-duty passenger vehicles (75 FR 25324–25728 and 77 FR 62624–63200).
Medium-and Heavy-Duty Vehicles	CARB In-Use On-Road Heavy-Duty Diesel Vehicles Regulation (Truck and Bus Regulation)	Any heavy-duty trucks associated with the Project will be subject to CARB standards. The regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet PM filter requirements. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. The regulation applies to nearly all privately and federally owned diesel fueled trucks and buses and to privately and publicly owned school buses with a gross vehicle weight rating greater than 14,000 pounds. To further reduce emissions, the Advanced Clean Truck Act (ACT) requires original equipment manufacturers of medium- and heavy-duty vehicles to sell ZEVs or near-zero-emissions vehicles (NZEVs) such as plug-in electric hybrids as an increasing percentage of their annual sales from 2024 to 2035. The ACT includes a cap-and-trade system, capping the number of fossil fuel vehicles sold by stipulating annual sales percentage requirements. Manufacturers can comply with the ACT by generating compliance credits through the sale of ZEVs or NZEVs or through the trading of compliance credits.
	CARB In-Use Off-Road Diesel Vehicle Regulation	Any relevant vehicle or machine use associated with the Project will be subject to CARB standards. The CARB In-Use-Off-Road Diesel Vehicle Regulation applies to certain off-road diesel engines, vehicles, or equipment greater than 25 horsepower. The regulations impose limits on idling, require a written idling policy, and require a disclosure when selling vehicles; require all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; restricted the adding of older vehicles into fleets starting on January 1, 2014; and require fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e.,

PROJECT COMPONENT	*APPLICABLE LAWS/REGULATIONS*	*GREENHOUSE GAS REDUCTION MEASURES REQUIRED FOR PROJECT*
		exhaust retrofits). The requirements and compliance dates of the Off-Road regulation vary by fleet size, as defined by the regulation.
	Heavy-Duty Vehicle GHG Emission Reduction Regulation	Any relevant vehicle or machine use associated with the Project will be subject to CARB standards. The CARB Heavy-Duty Vehicle GHG Emission Reduction Regulation applies to heavy-duty tractors that pull 53-foot or longer box-type trailers (CCR, Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 1, Section 95300 et seq.). Fuel efficiency is improved through improvements in tractor and trailer aerodynamics and the use of low rolling resistance tires.
	EPH and NHTSA GHG and CAFÉ standards.	Mobile sources that travel to and from the Project site would be subject to EPA and NHTSA GHG and CAFE standards for medium-and heavy-duty vehicles (76 FR 57106–57513).
		WATER USE
Water Use Efficiency	Emergency State Water Board Regulations	Water use associated with the Project will be subject to emergency regulations. On May 18, 2016, partially in response to EO B-27-16, the State Water Board adopted emergency water use regulations (CCR, title 23, Section 864.5 and amended and re-adopted Sections 863, 864, 865, and 866). The regulation directs the State Water Board, Department of Water Resources, and CPUC to implement rates and pricing structures to incentivize water conservation, and calls upon water suppliers, homeowner's associations, California businesses, landlords and tenants, and wholesale water agencies to take stronger conservation measures.
	SB X7-7	Water provided to the Project will be affected by SB X7-7's requirements for water suppliers. SB X7-7, or the Water Conservation Act of 2009, requires all water suppliers to increase water use efficiency. It also requires, among other things, that the Department of Water Resources, in consultation with other state agencies, develop a single standardized water use reporting form, which would be used by both urban and agricultural water agencies.
	CALGreen Code	The Project is subject to CALGreen's water efficiency standards, including a required 20% mandatory reduction in indoor water use (CALGreen Code, Division 4.3).
	California RPS	Electricity usage associated with Project water and wastewater

SHORT-TERM CONSTRUCTION GHG EMISSIONS

Estimated maximum GHG emissions associated with construction of the proposed Project are summarized in Table 3.7-3. These emissions include all worker vehicle, vendor vehicle, hauler vehicle, and off-road construction vehicle GHG emissions. For the purposes of this analysis, based on input from the Project applicant, the proposed Project is assumed to commence construction in 2025 and finish in late 2026. See Appendix B for further detail.

TABLE 3.7-3: TOTAL CONSTRUCTION GHG EMISSIONS (MT CO_2E/YEAR)

YEAR	*BIO- CO_2*	*NON-BIO-CO_2*	*TOTAL CO_2*	*CH_4*	*N_2O*	*REFRIGERANTS*	*CO_2E*
2025	0	605	605	0	0	0	612
2026	0	1,027	1,027	0	0	1	1,049
Total	**0**	**1,632**	**1,632**	**0**	**0**	**1**	**1,661**

SOURCES: CALEEMOD (V.2022.1)

As presented in the table, short-term construction emissions of GHGs are estimated to be a total of approximately 1,661 MT CO_2e.

OPERATIONAL GHG EMISSIONS

The operational GHG emissions estimate for the proposed Project includes on-site area, energy, mobile, waste, and water emissions. Estimated GHG emissions associated with operation of the proposed Project are summarized in Table 3.7-4, below. It should be noted that CalEEMod does not account for Governor Newsom's Zero-Emission by 2035 Executive Order (N-79-20), which requires that all new cars and passenger trucks sold in California be zero-emission vehicles by 2035; CalEEMod also does not account for the new CARB rules related to truck electrification (e.g. Advanced Clean Trucks Regulation). This is anticipated to substantially reduce the operational emissions associated with vehicles (i.e., mobile emissions) over time. The operational emissions results provided in Table 3.7-4 are likely an overestimate for mobile emissions, given the state's ongoing effort to increase electric vehicles and trucks. As shown in the Table 3.7-4, annual GHG emissions associated with the proposed Project would be approximately 12,188 MT CO_2e under the unmitigated scenario.

TABLE 3.7-4: OPERATIONAL GHG EMISSIONS AT BUILDOUT (METRIC TONS/YEAR) - UNMITIGATED

CATEGORY	*BIO- CO_2*	*NON-BIO- CO_2*	*TOTAL CO_2*	*CH_4*	*N_2O*	*REFRIGERANTS*	*CO_2E*
Mobile	0	9,559.3	9,559.3	0.3	0.4	2.4	9,692.3
Area	0	11.3	11.3	0.0	0.0	0	11.3
Energy	0	2,127.1	2,127.1	0.2	0.0	0	2,138.1
Water	11.8	40.7	52.5	1.2	0.0	0	91.6
Waste	72.1	0	72.1	7.2	0.0	0	252.2
Refrig.	0	0	0	0	0	2.1	2.1
Total	**83.9**	**11,738.4**	**11,822.2**	**8.9**	**0.5**	**4.5**	**12,187.6**

SOURCES: CALEEMOD (V.2022.1)

CONSISTENCY WITH 2022 SCOPING PLAN

The CARB's 2022 Scoping Plan (the latest version of the Scoping Plan) provides policies that are considered needed to meet the State's mid-term and long-term GHG emissions reduction targets. Specifically, the CARB's *Final* 2022 Scoping Plan identifies that it "…lays out the sector-by-sector roadmap for California, the world's fifth largest economy, to achieve carbon neutrality by 2045 or earlier…". The Scoping Plan addresses recent legislation and direction from Governor Newsom, by extending and expanding upon the earlier Scoping Plans with a target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045, and adding carbon neutrality as a science-based guide and touchstone for California's climate work. The Scoping Plan is therefore consistent with the AB 1279 GHG reduction targets of achieving carbon neutrality by 2045, and reducing anthropogenic emissions to 85 percent below 1990 levels by 2045. The Project's consistency with the applicable 2022 Scoping Plan policies is discussed in Table 3.7-5, below.

TABLE 3.7-5: PROJECT CONSISTENCY WITH THE 2022 SCOPING PLAN

POLICY	*PROJECT CONSISTENCY*
TRANSPORTATION ELECTRIFICATION	
Convert local government fleets to ZEVs and provide EV charging at public sites	**No Conflict.** While this goal is not applicable to an individual residential or commercial development project, the Project includes an EV parking requirement and includes EV spaces consistent with the requirements of the California Energy Code (CCR Title 24, Part 6).
Create a jurisdiction-specific ZEV ecosystem to support deployment of ZEVs statewide (such as building standards that exceed state building codes, permit streamlining, infrastructure siting, consumer education, preferential parking policies, and ZEV readiness plans)	
VMT REDUCTION	
Reduce or eliminate minimum parking standards	**No Conflict.** Although this goal is not applicable to an individual residential or commercial development project, the Project is implementing neighborhood design improvements such as pedestrian network improvements and traffic calming measures. Furthermore, the proposed Project would enable walkable development.
Implement Complete Streets policies and investments, consistent with general plan circulation element requirements	
Increase access to public transit by increasing density of development near transit, improving transit service by increasing service frequency, creating bus priority lanes, reducing or eliminating fares, microtransit, etc.	
Increase public access to clean mobility options by planning for and investing in electric shuttles, bike share, car share, and walking	
Implement parking pricing or transportation demand management pricing strategies	
Amend zoning or development codes to enable mixed-use, walkable, transit-oriented, and compact infill development (such as increasing the allowable density of a neighborhood)	
Preserve natural and working lands by implementing land use policies that guide development toward infill areas and do not convert "greenfield" land to urban uses (e.g., green belts, strategic conservation easements)	

Policy	*Project Consistency*
Building Decarbonization	
Adopt all-electric new construction reach codes for residential and commercial uses	**<u>No Conflict.</u>** Although this goal is not applicable to an individual residential or commercial development project, the Project would be consistent with the applicable Title 24 Building Envelope Energy Efficiency Standards, which ensure highly energy efficient development. The Title 24 Building Energy Efficiency standards also require rooftop solar PV systems for some of the Project buildings. Additionally, the proposed Project would utilize electricity from PG&E, which has been increasing its overall supply of renewable energy as part of its overall energy portfolio, consistent with the State's Renewable Portfolio Standard. More detail is provided under Impact 3.7-2, below.
Adopt policies and incentive programs to implement energy efficiency retrofits for existing buildings, such as weatherization, lighting upgrades, and replacing energy-intensive appliances and equipment with more efficient systems (such as Energy Star-rated equipment and equipment controllers)	
Adopt policies and incentive programs to electrify all appliances and equipment in existing buildings such as appliance rebates, existing building reach codes, or time of sale electrification ordinances	
Facilitate deployment of renewable energy production and distribution and energy storage on privately owned land uses (e.g., permit streamlining, information sharing)	
Deploy renewable energy production and energy storage directly in new public projects and on existing public facilities (e.g., solar photovoltaic systems on rooftops of municipal buildings and on canopies in public parking lots, battery storage systems in municipal buildings)	

Source: 2022 Scoping Plan, Table 1, Appendix D

The proposed Project's operational emissions would be reduced as regulations are implemented by the CARB and other State agencies to comply with the statewide GHG reduction targets. Many of these regulations are already identified in the 2022 Scoping Plan. These statewide actions are anticipated to reduce operational GHG emissions even further below those identified in Table 3.7-3, Table 3.7-4, and Table 3.7-5. For example, the proposed Project's transportation emissions would be expected to decline as vehicle efficiency standards are implemented beyond the Advanced Clean Cars II program and the Low Carbon Fuel Standard is strengthened. Furthermore, CalEEMod does not account for Governor Newsom's Zero-Emission by 2035 Executive Order (N-79-20) or CARB's subsequent regulations, which requires that all new cars and passenger trucks sold in California be zero-emission vehicles by 2035. This is anticipated to substantially reduce the operational emissions associated with passenger vehicles (i.e. mobile emissions) further, over time.

Overall, the proposed Project would not conflict with the 2022 Scoping Plan. The proposed Project would be developed according to the latest State and federal regulatory requirements, including those associated with operational building energy efficiency. Therefore, the Project would be considered consistent with the 2022 Scoping Plan. Based on this, recognizing the CARB as an authoritative substantial evidence source in evaluating post-2020 GHG impacts, since the proposed Project would be consistent with the CARB's 2022 Scoping Plan*,* buildout of the proposed Project would not interfere with the main programs the CARB has identified to support its conclusions that the State is on a trajectory to meet the 2045 GHG target. Overall, the proposed

Project would not impede the 2022 Scoping Plan and would help the State to progress towards this target.

CONSISTENCY WITH SJCOG'S 2022 RTP/SCS

The SJCOG's 2022 RTP/SCS includes eight policies with corresponding implementation strategies for conserving energy, maximizing mobility and accessibility, increasing safety and security, preserving the transportation system, supporting economic development, promoting interagency cooperation and public participation, maximizing cost effectiveness, and improving quality of life for residents. These strategies include similar measures to the 2022 Scoping Plan, such as supporting energy and water efficiency. The Project's consistency with the applicable 2022 RTP/SCS strategies is discussed in Table 3.7-6, below.

TABLE 3.7-6: PROJECT CONSISTENCY WITH THE SJCOG'S 2022 RTP/SCS

POLICY	*PROJECT CONSISTENCY*
Enhance the Environment for Existing and Future Generations and Conserve Energy	Consistent. The Project would utilize electricity provided by Pacific Gas & Electric (PG&E) which is required to meet the future year renewable portfolio performance standards. In addition, future development associated with Project implementation would be required to meet the applicable requirements of the 2022 (or more current) Title 24 Building Energy Efficiency Standards, which includes requirements for rooftop solar PV as well as energy efficiency requirements for the Project buildings and appliances.
Maximize Mobility and Accessibility	Consistent. Although this Project is not a transportation improvement project, the proposed Project would include many project features that improve mobility and accessibility, including improving local roadways and pedestrian facilities.
Increase Safety and Security	Consistent. The Project would be developed using the latest State and local requirements relating to safety and security. Development of the Project site would include other uses to support and complement the proposed residential development include public utility infrastructure, public and private roadways, curb/gutters/sidewalks, other pedestrian facilities, private parking, street lighting, and street signage, which would enhance the safety and security of the site and it surroundings, by connecting to existing development.
Preserve the Efficiency of the Existing Transportation System	Not applicable. This is not a transportation improvement project and is therefore not applicable. However, roadway improvements within the vicinity of the Project site are proposed, which would increase the efficiency of the local transportation system. Moreover, the Project would not interfere with the efficiency of any existing transportation system.
Support Economic Vitality	Consistent. The proposed Project would provide new taxable revenue, as well as create some local jobs (primarily during Project construction, although some jobs would also be created during Project operation), thereby supporting economic vitality.
Promote Interagency Coordination and Public Participation for Transportation Decision-Making and Planning Efforts	No Conflict. The proposed Project would engage in the required interagency coordination and public participation efforts, as applicable.
Maximize Cost Effectiveness	Consistent. The proposed Project would be developed based on market

POLICY	PROJECT CONSISTENCY
	demand. Therefore, implementation of the Project would be consistent with this policy.
Improve the Quality of Life for Residents	Consistent. The proposed Project would create local jobs and ancillary local economic activity (including generating more local tax revenue), thereby improving the quality of life for the local community.

SOURCE: SJCOG 2022 RTP/SCS

As shown in Table 3.7-6, above, the Project would not conflict with any of the GHG emissions reduction strategies contained in the SJCOG's 2022 RTP/SCS. Therefore, the Project is considered to be consistent with SJCOG's 2022 RTP/SCS.

EXECUTIVE ORDER S-3-05

The Executive Order S-3-05 2050 target has not been codified by legislation. However, studies have shown that, to meet the 2050 target, aggressive pursuit of technologies in the transportation and energy sectors, including electrification and the decarbonization of fuel, will be required. Because of the technological shifts required and the unknown parameters of the regulatory framework in 2050, quantitatively analyzing the project's impacts further relative to the 2050 goal is speculative for purposes of CEQA.[4]

The CARB recognizes that AB 32 establishes an emissions reduction trajectory that will allow California to achieve the more stringent 2050 target: "These [greenhouse gas emission reduction] measures also put the State on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80 percent below 1990 levels. This trajectory is consistent with the reductions that are needed globally to stabilize the climate." In addition, the CARB's First Update to the Scoping Plan "lays the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050," and many of the emission reduction strategies recommended by the CARB would serve to reduce the proposed project's post-2020 emissions level to the extent applicable by law:

- Energy Sector: Continued improvements in California's appliance and building energy efficiency programs and initiatives, such as the State's zero net energy building goals, would serve to reduce the proposed project's emissions level. Additionally, further additions to California's renewable resource portfolio would favorably influence the project's emissions level.
- Transportation Sector: Anticipated deployment of improved vehicle efficiency, zero-emission technologies, lower carbon fuels, and improvement of existing transportation systems all will serve to reduce the project's emissions level.
- Water Sector: The project's emissions level will be reduced because of further utilization of water conservation technologies.
- Waste Management Sector: Plans to further improve recycling, reuse and reduction of solid waste will beneficially reduce the project's emissions level.

[4] California Air Resources Board (CARB). 2014. First Update to the Climate Change Scoping Plan. Website: http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm Accessed August 2024.

In his January 2015 inaugural address, Governor Brown expressed a commitment to achieve "three ambitious goals" that he wanted to see accomplished by 2030 to reduce the State's GHG emissions:

- Increasing the State's Renewable Portfolio Standard from 33 percent in 2020 to 50 percent in 2030;
- Cutting the petroleum use in cars and trucks in half; and
- Doubling the efficiency of existing buildings and making heating fuels cleaner.

These expressions of executive branch policy may be manifested in adopted legislative or regulatory action through the State agencies and departments responsible for achieving the State's environmental policy objectives, particularly those relating to global climate change.[5]

Further, studies show that the State's existing and proposed regulatory framework will allow the State to reduce its GHG emissions level to 40 percent below 1990 levels by 2030, and to 80 percent below 1990 levels by 2050. Even though these studies did not provide an exact regulatory and technological roadmap to achieve the 2030 and 2050 goals, they demonstrated that various combinations of policies could allow the Statewide emissions level to remain very low through 2050, suggesting that the combination of new technologies and other regulations not analyzed in the studies could allow the State to meet the 2050 target.[6]

Given the proportional contribution of mobile source-related GHG emissions to the State's inventory, recent studies also show that relatively new trends—such as the increasing importance of web-based shopping, the emergence of different driving patterns, and the increasing effect of web-based applications on transportation choices—are beginning to substantially influence transportation choices and the energy used by transportation modes. These factors have changed the direction of transportation trends in recent years and will require the creation of new models to effectively analyze future transportation patterns and the corresponding effect on GHG emissions. For the reasons described above, the proposed project's post-2020 emissions trajectory is expected to follow a declining trend, consistent with the 2030 and 2050 targets.

MORE STRINGENT TITLE 24 STANDARDS

The proposed Project would be required to comply with the latest (i.e., 2022) version of the Title 24 standards, which are more stringent than the 2019 Title 24 standards that are modeled in CalEEMod.[7] Therefore, proposed Project emissions would continue to decline beyond the buildout

[5] Brown, Edmund G. Jr. 2015. Press Release: California Establishes Most Ambitious Greenhouse Gas Goal in North America. April 29, 2015.
Website: https://www.gov.ca.gov/news.php?id=18938. Accessed August 2024.
[6] Energy and Environmental Economics, 2015. Pathways to Deep Carbonization in the United States. Website: http://deepdecarbonization.org/wp-content/uploads/2015/11/US_Deep_Decarbonization_Technical_Report_Exec_Summary.pdf. Accessed Accessed August 2024.
[7] Since the latest version of CalEEMod (v.2022.1) only accounts for the energy efficiency requirements associated with the 2019 version of Title 24, and since there is no well-established methodology for quantifying the reductions in energy consumption associated with the 2022 version of Title 24 over the

year due to regulations that would indirectly affect Project emissions. Moreover, the Title 24 standards are anticipated to be revised again in Year 2025, with even stricter energy efficiency and renewable energy requirements for new development, which help to ensure that new development is consistent with the State's GHG reduction goals, consistent with the Scoping Plan.[8] These improvements to the Title 24 standards will be reflected in per capita GHG emission reductions at the Project buildout.

CONSISTENCY WITH THE SJVAPCD REQUIREMENTS

The proposed Project would be required to comply with all applicable SJVAPCD (i.e., Air District) Rules and regulations. For example, Regulations and rules that may apply to the proposed Project could include Regulation VIII that provides fugitive PM_{10} dust prohibitions; Rule 8021 that provides rules for PM_{10} dust prohibition associated with construction, demolition activities, excavation, extraction, and other earthmoving activities; Rule 4601 that provides rules to limit VOC emissions for architectural coatings. Moreover, the proposed Project would be required to comply with SJVAPCD Rule 9510, as described in further detail below.

SJVAPCD'S RULE 9510

In accordance with the SJVAPCD's Rule 9510, an Air Impact Assessment (AIA) is required to be prepared for the proposed Project based on the applicability and exemption criteria of the rule.[9] The rule includes general mitigation requirements for construction and/or operational emissions. Per the general mitigation requirements of Rule 9510, the Project would be required to reduce the Project's operational baseline NOx emissions 33.3%, and the Project's operational baseline PM_{10} emissions 50%, over a period of 10 years as quantified in the approved AIA. Although the purpose of Rule 9510 is to reduce NOx and PM_{10} emissions, rather than GHG emissions, it should be noted that these reductions are enforced through on- and off-site measures, many of which would also reduce GHG emissions. For example, according to the SJVAPCD's most recent Indirect Source Review Program annual report (*the Indirect Source Review Program 2022 Annual Report, July 1, 2021 to June 30, 2022*), during the reporting period (July 1, 2021 through June 30, 2022), the District spent ISR monies to fund clean-air emission reduction projects, including off-site projects such as the replacement of older, higher-emitting agricultural tractors with new latest-tier tractors, replacement of older, higher-emitting agricultural irrigation water pump engines with electric motors, retrofitting of residential open-hearth fireplaces with certified natural gas burning inserts, and a dairy feed mixer electrification project. Total off-site emission reductions alone for the reporting period totaled 50 tons of NOx and 86 tons of PM_{10}, for a paid-out total of $3,458,048, and a cost effectiveness of $25,438/ton.[10]

2019 version of Title 24, the CalEEMod modeling does not account for the energy efficiency improvements that would be associated with the 2022 (or future, more stringent) versions of Title 24.

[8] See: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2025-building-energy-efficiency

[9] Available at: https://www.valleyair.org/rules/currntrules/r9510-a.pdf. Accessed: August 2024.

[10] See the SJVAPCD's Indirect Source Review Rule Annual Report (2022) for more detail: https://ww2.valleyair.org/permitting/indirect-source-review-rule-overview/isr-annual-report/

These off-site emission reductions have the ancillary benefit of reducing GHG emissions, beyond what has been modeled herein. For example, the reduction in carbon intensity of natural gas burning inserts compared with open-hearth fireplaces is improved by 39.7%, according to data from Appendix G of the latest version of the CalEEMod v2022.1 Guidebook.[11] Although the reductions in GHGs will be attributed to the proposed Project through the Rule 9510 ISR, these reductions are not reflected in the Project GHG modeling estimates included herein, except that the modeling estimates do reflect that fact that the Project does not include any open-hearth fireplaces. It is notable, however, that the GHG reductions are projected to be substantial and are in alignment with the goals of the 2022 Scoping Plan.

CONCLUSION

The proposed Project would be consistent with relevant plans, policies, and regulations associated with GHGs, notably the most recent version of the CARB's Scoping Plan, and the SJCOG's 2022 RTP/SCS. This would ensure that the proposed Project would be consistent with, and would not impair, the State's carbon neutrality standard by year 2045 as established under AB 1279. The State is making progress toward reducing GHG emissions in key sectors such as transportation, industry, and electricity. Since the Project would be consistent with State GHG Plans, it would not impede the State's goals of reducing GHG emissions 40 percent below 1990 levels by 2030, and of achieving carbon neutrality by 2045. The proposed Project would make a reasonable fair share contribution to the State's GHG reduction goals, by implementing a wide array of Project features that would substantially reduce GHG emissions and therefore, the proposed Project's GHG emissions would be considered to have a ***less than significant*** impact.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.7-2: Project implementation would not result in the inefficient, wasteful, or unnecessary use of energy resources, and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency (Less than Significant)

According to the CEQA Guidelines, the means to achieve the goal of conserving energy include decreasing overall energy consumption, decreasing reliance on natural gas and oil, and increasing reliance on renewable energy sources. In particular, the proposed Project would be considered "wasteful, inefficient, and unnecessary" if it were to violate State and federal energy standards and/or result in significant adverse impacts related to Project energy requirements, energy inefficiencies, energy intensiveness of materials, effects on local and regional energy supplies or on requirements for additional capacity, compliance with existing energy standards, effects on energy

[11] See Table G-23 of the CalEEMod v2022.1 Appendix (Appendix G) for detail.

resources, or transportation energy use requirements. In addition, the Project could have a significant energy impact if it would conflict or create an inconsistency with an applicable plan, policy, or regulation for renewable energy or energy efficiency.

The proposed Project includes various characteristics that reduce the inefficient, wasteful, or unnecessary use of energy. Overall, a wide variety of additional Project features would also be implemented that would substantially reduce energy emissions. For example, the Project would comply with State requirements such as the energy efficiency requirements of the latest version of the California Title 24 Energy Efficiency Standards. The Project is also anticipated to produce on-site solar photovoltaic (PV) for on-site use, also consistent with the latest version of the California Title 24 Energy Efficiency Standards.

Moreover, it should be noted that, over time, electrification of the vehicles will increase due to state requirements, and state and national trends. Electric charging infrastructure would be installed on the property to facilitate the conversion of the truck fleet to zero-emission electric trucks as they become available in the market and used for truck deliveries to and from the facility.

The amount of energy used by the proposed Project during operation would include the amount of energy used by Project buildings and outdoor lighting, and the fuel used by vehicle trips generated during Project construction and operation, fuel used by off-road construction vehicles during construction activities, and fuel used by Project maintenance activities during Project operation. The following discussion provides a detailed calculation of energy usage expected for the proposed Project, as provided by applicable modelling software (i.e., CalEEMod v2022.1) and the CARB Emission Factor model (EMFAC2021). Additional assumptions and calculations are provided within Appendix B of this EIR.

ELECTRICITY AND NATURAL GAS

Electricity and natural gas used by the proposed Project would be used primarily to generate energy for Project buildings, as well as for landscaping, street and outdoor parking lot lighting. As shown in further detail in the CalEEMod modeling outputs provided in Appendix B, "Energy" is one of the categories that was modeled for GHG emissions. As also shown in the CalEEMod modeling outputs as provided in Appendix B, the proposed Project as a whole is anticipated to consume approximately 7,775,447 kWh of electricity per year and approximately 26,530,103 kBTU per of natural gas per year (see Appendix B for detail).

The proposed Project's buildings would be designed and constructed in accordance with the City's latest adopted energy efficiency standards, which are based on the State's Title 24 Energy Efficiency Standards for Residential Buildings and Green Building Code Standards. These standards include minimum energy efficiency requirements related to building envelope, mechanical systems (e.g., heating, ventilation, and air conditioning [HVAC] and water heating systems), and indoor and outdoor lighting, are widely regarded as the some of the most advanced and stringent building energy efficiency standards in the country. In addition, the on-site solar PV system would meet the State legal requirements. As such, the design of the proposed project would facilitate the future commitment to renewable energy resources. Therefore, building energy consumption would not be considered wasteful, inefficient, or unnecessary.

ON-ROAD VEHICLES (OPERATION)

The proposed Project would generate vehicle trips (i.e., passenger vehicles for employees and heavy-duty trucks for hauling) during its operational phase. Compliance with applicable State laws and regulations would limit idling and a part of a comprehensive regulatory framework that is implemented by the CARB. A description of Project operational on-road mobile energy usage is provided below.

According to the *Traffic Impact Analysis Report* prepared for the proposed Project (TJKM, 2024), and as described in more detail in Section 3.13 of this EIR, the proposed Project would increase total vehicle trips by approximately 8,600 new daily trips. To calculate operational on-road vehicle energy usage, De Novo Planning Group used fleet mix data from the CalEEMod (v.2022.1) output for the proposed Project, and Year 2026 gasoline and diesel MPG (miles per gallon) factors for individual vehicle classes as provided by EMFAC2021, to derive weighted average gasoline and diesel MPG factors for the vehicle fleet. Based on these calculations, as provided in Appendix B, upon full buildout, the proposed Project would generate operational vehicle trips that would use a total of approximately 20,701 gallons of gasoline and 4,081 gallons of diesel per day, or 7,555,720 gallons of gasoline and 1,489,539 gallons of diesel per year.

ON-ROAD VEHICLES (CONSTRUCTION)

The proposed Project would also generate on-road vehicle trips during Project construction (from construction workers and vendors travelling to and from the Project site). De Novo Planning Group estimated the vehicle fuel consumed during these trips based on the assumed construction schedule, vehicle trip lengths and number of workers per construction phase as provided by CalEEMod, and Year 2025 gasoline and diesel MPG factors provided by EMFAC2021 (year 2025 factors were used to represent a conservative analysis, as the energy efficiency of construction activities is anticipated to improve over time). For the sake of simplicity and to be conservative, it was assumed that all construction worker light duty passenger cars and truck trips use gasoline as a fuel source, and all medium and heavy-duty vendor trucks use diesel fuel. Table 3.7-7, below, describes gasoline and diesel fuel consumed during each construction phase (in aggregate). As shown, the vast majority of on-road mobile vehicle fuel used during the construction of the proposed Project would occur during the building construction phase. See Appendix B of this EIR for a detailed accounting of construction on-road vehicle fuel usage estimates.

TABLE 3.7-7: ON-ROAD MOBILE FUEL USAGE BY PROJECT CONSTRUCTION ACTIVITIES – BY PHASE [A]

CONSTRUCTION PHASE	TOTAL GALLONS OF GASOLINE FUEL(B)	TOTAL GALLONS OF DIESEL FUEL(B)
Site Preparation	469	0
Grading	427	0
Building Construction	2,278	2,562
Paving	551	0
Architectural Coatings	456	0
Total	**4,181**	**2,562**

NOTE: (A) PROVIDED BY CALEEMOD OUTPUT. (B) SEE APPENDIX B OF THIS EIR FOR FURTHER DETAIL

SOURCE: CALEEMOD (V.2022.1); EMFAC2021.

OFF-ROAD EQUIPMENT (CONSTRUCTION)

Off-road construction equipment would use diesel fuel during the construction phase of the proposed Project. A non-exhaustive list of off-road constructive equipment expected to be used during the construction phase of the proposed Project includes: forklifts, generator sets, tractors, excavators, and dozers. Based on the total amount of CO_2 emissions expected to be generated by the proposed Project (as provided by the CalEEMod output), and standard conversion factors (as provided by the U.S. Energy Information Administration), the proposed Project would use a total of approximately 29,276 gallons of diesel fuel for off-road construction equipment. Detailed calculations are provided in Appendix B of this EIR.

State laws and regulations would limit idling from both on-road and off-road diesel-powered equipment and are part of a comprehensive regulatory framework that is implemented by the CARB. Additionally, as a practical matter, it is reasonable to assume that the overall construction schedule and process would be designed to be as efficient as feasible to avoid excess monetary costs. For example, equipment and fuel are not typically used wastefully due to the added expense associated with renting the equipment, maintaining it, and fueling it. Therefore, the opportunities for further future efficiency gains during construction are limited. For the foregoing reasons, it is anticipated that the construction phase of the project would not result in wasteful, inefficient, and unnecessary consumption of energy.

CONCLUSION

The proposed Project would use energy resources for the operation of Project buildings (natural gas and electricity), outdoor lighting (electricity), on-road vehicle trips (e.g. gasoline and diesel fuel) generated by the proposed Project, and off-road and on-road construction activities associated with the proposed Project (e.g. diesel fuel). Each of these activities would require the use of energy resources. The proposed Project would be responsible for conserving energy, including through the mitigation measures provided throughout this EIR, as well as through the implementation of statewide and local measures.

The proposed Project would comply with all applicable federal, State, and local regulations regulating energy usage. Moreover, much of the electricity demand of the proposed Project would come from on-site renewable sources such as rooftop solar PV. Other statewide measures, including those intended to improve the energy efficiency of the statewide passenger and heavy-duty truck vehicle fleet (e.g., the Pavley Bill and the Low Carbon Fuel Standard), would improve vehicle fuel economies, thereby conserving gasoline and diesel fuel. These energy savings would continue to accrue over time. Moreover, the proposed Project would comply with the City's General Plan goals, objectives and policies related to energy conservation that are relevant to this analysis.

The proposed Project would comply with all existing energy standards and would not be expected to result in significant adverse impacts on energy resources. For these reasons, the proposed Project would not cause an inefficient, wasteful, or unnecessary use of energy resources nor cause a significant impact on any of the energy-related thresholds as described by the *CEQA Guidelines*. This is a ***less than significant*** impact.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

This page left intentionally blank.

The purpose of this section is to disclose and analyze the potential impacts associated with hazards and hazardous materials related to the Project area and general vicinity, and to analyze the potential for exposure of people to hazards and hazardous materials as the Project is built and operated in the future. This section is based in part on the *Draft Environmental Impact Report for the Lathrop General Plan Update* (City of Lathrop, 2022) and the *City of Lathrop General Plan* (City of Lathrop, 2022).

There were no comment letters received during the NOP comment period that specifically address hazards and hazardous materials. Full comments received are included in Appendix A.

3.8.1 ENVIRONMENTAL SETTING

PHYSICAL SETTING

Project Location

The Project site consists of the Mossdale Landing West Specific Plan Area, located within the West Lathrop Specific Plan (WLSP) area in the City of Lathrop. The site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The site is located on the following Assessor's Parcel Numbers (APNs): 191-190-74, 191-190-75, 191-190-76, 191-190-77, 191-190-78, 191-340-03, 191-610-02, 191-610-22, 191-620-50, and 191-620-59.

Existing Site Uses

The majority of the Projecty site is currently undeveloped and consists primarily of agricultural uses. There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

Existing Surrounding Uses

Land uses surrounding the Project site include the San Joaquin River and associated tributaries to the north, west, and south; vacant agricultural land San Joaquin County to the north and west; Mossdale Landing, a mixed use master planned community with largely single-family residences in the Project vicinity to the east; and single-family residential uses to the west and south.

Site Topography

The elevation of the Project site is generally flat and ranges from approximately 14 feet to 21 feet above mean sea level.

HAZARDS ASSESSMENT

For the purposes of this EIR, "hazardous material" is defined as provided in California Health & Safety Code, Section 25501:

> *Any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment.*

"Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

"Hazardous waste" is a subset of hazardous materials. For the purposes of this EIR, the definition of hazardous waste is essentially the same as that in the California Health & Safety Code, Section 25517, and in the California Code of Regulations (CCR), Title 22, Section 66261.2:

> *Hazardous wastes are wastes that, because of their quantity, concentration, physical, chemical, or infectious characteristics, may either cause, or significantly contribute to, an increase in mortality or an increase in serious illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.*

CCR Title 22 categorizes hazardous waste into hazard classes according to specific characteristics of ignitibility, corrosivity, reactivity, or toxicity. Hazardous waste with any of these characteristics is also known as a Resource Conservation and Recovery Act (RCRA) waste.

Hazardous materials can be categorized as hazardous non-radioactive chemical materials, radioactive materials, toxic materials, and biohazardous materials. The previous definitions are adequate for non-radioactive hazardous chemicals. Radioactive and biohazardous materials are further defined as follows:

- Radioactive materials contain atoms with unstable nuclei that spontaneously emit ionizing radiation to increase their stability.
- Radioactive wastes are radioactive materials that are discarded (including wastes in storage) or abandoned.
- Toxic wastes are harmful or fatal when ingested or absorbed (e.g., containing mercury, lead). When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute groundwater.
- Biohazardous materials include materials containing certain infectious agents (microorganisms, bacteria, molds, parasites, and viruses) that cause or significantly contribute to increased human mortality or organisms capable of being communicated by invading and multiplying in body tissues.
- Medical wastes include both biohazardous wastes (byproducts of biohazardous materials) and sharps (devices capable of cutting or piercing, such as hypodermic needles, razor blades, and broken glass) resulting from the diagnosis, treatment, or immunization of human beings, or research pertaining to these activities.

There are countless categories of hazardous materials and hazardous wastes that could be found on any given property based on past uses. Some common examples include agrichemicals (chlorinated herbicides, organophosphate pesticides, and organochlorine pesticides, such as such as Mecoprop (MCPP), Dinoseb, chlordane, dichloro-diphenyltrichloroethane (DDT), and dichloro-diphenyl-dichloroethylene (DDE)), petroleum based products (oil, gasoline, diesel fuel), a variety of chemicals including paints, cleaners, and solvents, and asbestos-containing or lead-containing materials (e.g., paint, sealants, pipe solder).

Environmental Records and Databases

There is a broad list of federal, state, and local databases that provide information for sites with varying potential for risk from the possible existence of hazardous materials. A search of local, State, and federal agency databases for the Project site and known contaminated sites in the vicinity was performed. No parcels within or adjacent to the Project site were found to contain a known contamination. Results of the environmental records search are described below.

Toxic Release Inventory: The U.S. Environmental Protection Agency (EPA) Toxic Release Inventory (TRI) tracks the management of certain toxic chemicals that may pose a threat to human health and the environment. The TRI database does not identify the Project site as containing data on disposal or other releases of toxic chemicals.[1] The nearest TRI site is the JR Simplot Co., located at 16777 S Howland Road, approximately two miles east of the Project site.

Envirostor: The California Department of Toxic Substances Control (DTSC) maintains the *Envirostor Data Management System*, which provides information on hazardous waste facilities (both permitted and corrective action) as well as any available site cleanup information. This site cleanup information includes: Federal Superfund Sites (NPL), State Response Sites, Voluntary Cleanup Sites, School Cleanup Sites, Corrective Action Sites, Tiered Permit Sites, and Evaluation/Investigation Sites. The hazardous waste facilities include: Permitted–Operating, Post-Closure Permitted, and Historical Non-Operating.

There are no site locations listed in the EnviroStor database within the Project site.[2] The EnviroStor database lists three “school investigation” sites within 1.5 miles of the Project site, indicating an investigation was conducted and overseen by the DTSC for a proposed school site. All three of these sites received a “No Further Action” status, indicating that a preliminary assessment found no actual or potential hazardous materials release or naturally occurring hazardous material that would pose a threat to human health or the environment. See Table 3.8-1 for a complete list of sites identified by the EnviroStor database within 1.5 miles of the Project site.

[1] United States Environmental Protection Agency, 2024. TRI Toxics Tracker. Available: https://edap.epa.gov/public/extensions/TRIToxicsTracker/TRIToxicsTracker.html#continue. Accessed: March 12, 2024.

[2] California Department of Toxic Substances Control, 2024. EnviroStor Database. Available: https://www.envirostor.dtsc.ca.gov/public/map/?global_id=80001279. Accessed: March 12, 2024.

TABLE 3.8-1: ENVIROSTOR HAZARDOUS MATERIAL RELEASE SITES WITHIN 1.5 MILES OF PROJECT SITE

SITE NAME	TYPE	STATUS	ADDRESS
Proposed River Islands MS/ES	School Investigation	No Further Action (as of 2007)	San Joaquin Road and north of Stewart Road
Terry School	School Investigation	No Further Action (as of 2003)	401/801 W Louise Avenue
River Islands Stage 2A K-8 School	School Investigation	No Further Action (as of 2022)	2760 Penrose Lane

SOURCE: CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, 2024. ENVIROSTOR DATABASE. AVAILABLE: HTTPS://WWW.ENVIROSTOR.DTSC.CA.GOV/PUBLIC/MAP/?GLOBAL_ID=80001279. ACCESSED: MARCH 12, 2024.

GeoTracker: *GeoTracker* is the State Water Resources Control Board's (SWRCB's) data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Underground Storage Tanks, Department of Defense, Site Cleanup Program).

There are no site locations listed in the GeoTracker database within the Project site.[3] The GeoTracker database lists three Leaking Underground Storage Tank (LUST) Cleanup Sites and one Cleanup Program Site within 1.5 miles of the Project site. These sites all have a status of "Completed – Case Closed" indicating that a closure letter or other formal closure decision document has been issued for the site. There are also two permitted underground storage tank (UST) sites within 1.5 miles of the Project site. See Table 3.8-2 for a complete list of sites identified by the GeoTracker database within 1.5 miles of the Project site.

TABLE 3.8-2: GEOTRACKER HAZARDOUS MATERIAL RELEASE SITES WITHIN 1.5 MILES OF PROJECT SITE

SITE NAME	TYPE	STATUS	ADDRESS
D'Arcy Parkway Road Extension	Cleanup Program Site	Completed – Case Closed (as of 1998)	400-500 D'Arcy Parkway
ARCO 06080 Case #1	LUST Cleanup Site	Completed – Case Closed (as of 1995)	85 E Louise Avenue
ARCO 06080 Case #2	LUST Cleanup Site	Completed – Case Closed (as of 2007)	85 E Louise Avenue
Phillips 66	LUST Cleanup Site	Completed – Case Closed (as of 2014)	16500 S Harlan Road
Lathrop Shell	Permitted UST	--	16500 S Harlan Road
ARCO 06080	Permitted UST	--	85 E Louise Avenue

NOTES: UST = UNDERGROUND STORAGE TANK, LUST = LEAKING UNDERGROUND STORAGE TANK.
SOURCE: CALIFORNIA STATE WATER RESOURCES CONTROL BOARD, 2024. GEOTRACKER. AVAILABLE: HTTPS://GEOTRACKER.WATERBOARDS.CA.GOV/MAP/?GLOBAL_ID=10181271&GEOTRACKER_UST=TRUE#. ACCESSED: MARCH 12, 2024.

Solid Waste Information System: The Solid Waste Information System (SWIS) is a database of solid waste facilities that is maintained by the California Department of Resources Recycling and Recovery (CalRecycle). The SWIS data identifies active, planned, and closed sites. The Project site

[3] California State Water Resources Control Board, 2024. GeoTracker. Available: https://geotracker.waterboards.ca.gov/map/?global_id=10181271&geotracker_ust=true#. Accessed: March 12, 2024.

does not have any active or planned solid waste facilities listed in the database.[4] The nearest active facility, Central Valley Compost, is located approximately 2.4 miles north of the Project site.

National Priorities List: The National Priorities List (NPL) of Superfund Sites and Proposed NPL Sites is EPA's database of more than 1,200 sites designated or proposed for priority cleanup under the Superfund program. The Project site is not listed in this database.[5]

RCRIS System: The Resource Conservation and Recovery Information System (RCRIS) is an EPA database that includes selective information on sites that generate, transport, store, treat, and/or dispose of hazardous waste as defined by RCRA. Identification on this list does not indicate that there has been an impact on the environment. The Project site is not listed in this database.[6]

CERCLIS Data: The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) is an EPA database that contains information on potential hazardous waste sites that have been reported to the EPA by states, municipalities, private companies, and individuals, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites that are either proposed for or on the NPL, as well as sites that are in the screening and assessment phase for possible inclusion on the NPL. The Project site is not listed in this database.

CORRACTS: Corrective Action Report (CORRACTS) is an EPA database that identifies hazardous waste handlers with RCRA corrective action activity. The Project site is not listed in this database.[7]

Cortese List: The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with the California Environmental Quality Act (CEQA) requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California Environmental Protection Agency (Cal EPA) to develop at least annually an updated Cortese List. The DTSC is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List.

The Project site is not on the Cortese List.

---

[4] California Department of Resources Recycling and Recovery, 2004. SWIS Facility/Site Search. Available: https://www2.calrecycle.ca.gov/SolidWaste/Site/Search. Accessed: March 19, 2024.

[5] United States Environmental Protection Agency, 2024. Superfund National Priorities List (NPL) Where You Live Map. Available: https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=33cebcdfdd1b4c3a8b51d416956c41f1. Accessed: March 19, 2024.

[6] United States Environmental Protection Agency, 2024. RCRAINFO Search. Available: https://enviro.epa.gov/envirofacts/rcrainfo/search. Accessed: March 19, 2024.

[7] United States Environmental Protection Agency, 2024. Search RCRA Corrective Action / Progress Track Facilities. Available: https://ordspub.epa.gov/ords/cimc/f?p=121:15:6250391337320. Accessed: March 19, 2024.

AIR TRAFFIC HAZARDS

There are no private or public airport facilities within the City. The nearest regional public use airport is the Stockton Metropolitan Airport, located approximately six miles to the northeast, in the city of Stockton. The Project site is not located within the airport influence area for the Stockton Metropolitan Airport.[8]

OTHER POTENTIAL HAZARDS

Fire Hazards

The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents) and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point.

The California Department of Forestry and Fire Protection (CAL FIRE) classifies lands within State Responsibility Areas (SRAs) into Fire Hazard Severity Zones (FHSZs). These lands represent the risks associated with wildland fires and are designated by CAL FIRE as moderate, high, or very high FHSZs based on fuel loading, slope, fire weather, and other relevant factors. Incorporated areas such as the City are considered Local Responsibility Areas (LRAs), meaning that the City and/or other local fire districts are responsible for fire protection services.

There are no areas classified as very high fire hazard severity zones within the City, including the project site.[9] Additionally, as discussed in the General Plan EIR, the entire City of Lathrop is considered to have negligible wildfire fire threat, as much of the land use is urban or irrigated agricultural land.[10]

Asbestos-Containing Materials (ACM)

Asbestos, a natural fiber used in the manufacturing of different building materials, has been identified as a human carcinogen. Most friable (i.e., easily broken or crushed) asbestos-containing materials (ACM) were banned in building materials by 1978. By 1989, most major manufacturers had voluntarily removed non-friable ACM (i.e., flooring, roofing, and mastics/sealants) from the market. These materials, however, were not banned completely. The Project site includes existing development prior to 1978; therefore, ACM may be present in some structures.

---

[8] Coffman Associates, Inc., May 2016 (Amended February 2018. Airport Land Use Compatibility Plan Update for the Stockton Metropolitan Airport. Available: https://www.sjcog.org/DocumentCenter/View/1318/2016-Stockton-Metropolitan-Airport-ALUCP---Amended-February-2018?bidId=. Accessed: March 19, 2024.

[9] California Department of Forestry and Fire Protection, 2008. Fire Hazard Severity Zones Maps. Available: https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones/fire-hazard-severity-zones-maps. Accessed: March 19, 2024.

[10] De Novo Planning Group, 2022. Final Environmental Impact Report for the Lathrop General Plan Update. August.

Lead-Based Paint

Lead-based paint has been identified by the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA), and the Department of Housing and Urban Development (HUD) as a potential health risk to humans, particularly children, based on its effects to the central nervous system, kidneys, and bloodstream. The risk of lead-based paint has been classified by HUD based upon the age and condition of the painted surface. The Project site includes existing development prior to 1978; therefore, lead-based paint may be present in some structures.

3.8.2 REGULATORY SETTING

FEDERAL

Resource Conservation and Recovery Act

The Federal Toxic Substances Control Act of 1976 and Resource Conservation and Recovery Act (RCRA) established a program administered by the U.S. EPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the “cradle to grave” system of regulating hazardous wastes.

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) introduced active federal involvement to emergency response, site remediation, and spill prevention, most notably the Superfund program. CERCLA was intended to be comprehensive in encompassing both the prevention of, and response to, uncontrolled hazardous substances releases. CERCLA deals with environmental response, providing mechanisms for reacting to emergencies and to chronic hazardous material releases. In addition to establishing procedures to prevent and remedy problems, it establishes a system for compensating appropriate individuals and assigning appropriate liability. It is designed to plan for and respond to failure in other regulatory programs and to remedy problems resulting from action taken before the era of comprehensive regulatory protection.

Clean Water Act

The Clean Water Act (CWA), which amended the Water Pollution Control Act (WPCA) of 1972, sets forth the Section 404 program to regulate the discharge of dredged and fill material into Waters of the United States and the Section 402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the United States. The Section 401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of Federal permits and approvals (including CWA Section 404, CWA Section 402, Federal Energy Regulatory Commission Hydropower and Section 10 of the Rivers and Harbors Act).

Natural Gas Pipeline Safety Act

The Natural Gas Pipeline Safety Act authorizes the U.S. Department of Transportation Office of Pipeline Safety to regulate pipeline transportation of natural (flammable, toxic, or corrosive) gas and other gases as well as the transportation and storage of liquefied natural gas. The Office of Pipeline Safety regulates the design, construction, inspection, testing, operation, and maintenance of pipeline facilities. While the federal government is primarily responsible for developing, issuing, and enforcing pipeline safety regulations, the pipeline safety statutes provide for State assumption of the intrastate regulatory, inspection, and enforcement responsibilities under an annual certification. To qualify for certification, a state must adopt the minimum federal regulations and may adopt additional or more stringent regulations as long as they are not incompatible.

Federal Railroad Administration

The Federal Railroad Administration (FRA) is responsible for promulgating and enforcing rail safety regulations. These regulations are codified at Title 49 of the Code of Federal Regulations (CFR) Parts 200–299. The FRA administers a safety program that oversees the movement of hazardous materials (including dangerous goods), such as petroleum, chemical, and nuclear products, throughout the United States' rail transportation system, including shipments transported to and from international organizations.

Occupational Safety and Health Act

The Occupational Safety and Health Administration (OSHA) administers the Occupational Safety and Health Act (29 USC 15), which requires special training of handlers of hazardous materials, notification to employees who work in the vicinity of hazardous materials, and acquisition from the manufacturer of material safety data sheets (MSDS). An MSDS describes the proper use of hazardous materials and is intended to provide workers and emergency personnel with procedures for handling or working with that material. The Occupational Health and Safety Act also requires the training of employees to remediate any hazardous materials accidental releases.

Hazardous Materials Transportation Act

The Hazardous Materials Transportation Act (HMTA) (49 USC 5101–5127) was enacted in 1975. HMTA's primary objective is to provide adequate protection against risks to life and property inherent in commercial transportation of hazardous materials by improving the regulatory and enforcement authority of the Secretary of Transportation. Hazardous materials, as defined by the Secretary of Transportation are any "particular quantity or form" of a material that "may pose an unreasonable risk to health and safety or property." Among the material designated as hazardous are explosives; radioactive materials; infectious substances; flammable or combustible liquids, solids, or gases; toxic, oxidizing, or corrosive materials; and compressed gases in specified forms and quantities. The regulations cited in the HMTA apply, but are not limited to, a person who transports hazardous materials, designs containers for, or prepares or accepts hazardous materials for transportation. HMTA governs safety aspects, including security, of the transportation of hazardous materials that the Secretary of the Department of Transportation (DOT) considers appropriate. Enforcement of the HMTA is shared by each of the following administrations under delegations from the Secretary of the DOT:

- Research and Special Programs Administration (RSPA) Responsible for container manufacturers, reconditioners, and retesters and shares authority over shippers of hazardous materials.
- Federal Highway Administration (FHWA) enforces all regulations pertaining to motor carriers.
- Federal Railroad Administration (FRA) enforces all regulations pertaining to rail carriers.
- Federal Aviation Administration (FAA) enforces all regulations pertaining to air carriers.
- Coast Guard enforces all regulations pertaining to shipments by water.

National Emissions Standards for Hazardous Air Pollutants

The Federal Clean Air Act (Clean Air Act) (42 USC 7401 et seq. 1970) requires the EPA to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with Clean Water Act Section 112, EPA established National Emissions Standards for Hazardous Air Pollutants (NESHAP) to protect the public. Asbestos was one of the first hazardous air pollutants regulated under Section 11240 CFR, Subpart M, Section 61.145. Asbestos is a naturally occurring fibrous material that was historically used in many building materials for fire-proofing and insulation. In general, buildings constructed prior to 1980 have the potential for asbestos-containing materials. The EPA has classified asbestos as a Group A, known human carcinogen.

Federal Insecticide, Fungicide and Rodenticide Act

The federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 USC 136 et seq. 1996) provides for federal regulation of pesticide distribution, sale, and use. All pesticides distributed or sold in the United States must be registered (licensed) by the EPA. Before EPA registers a pesticide under FIFRA, the applicant must show that, among other things, use of the pesticide according to specifications "will not generally cause unreasonable adverse effects on the environment." FIFRA imposes pesticide-labeling requirements; controls when and under what conditions pesticides can be applied, mixed, stored, loaded or used; specifies when fields can be reentered after pesticide application; and identifies when crops can be harvested. Under FIFRA, registrations and product labeling may restrict uses of pesticides. As a part of the pesticide registration, EPA classifies the product or some uses of the product as "restricted use" if it may cause unreasonable adverse effects even when used as directed on the product labeling. Only certified pesticide applicators may use restricted-use pesticides.

STATE

California Health and Safety Code

Cal EPA has established rules governing the use of hazardous materials and the management of hazardous wastes. Many of these regulations are embodied in the California Health and Safety Code (HSC). The code includes regulations that govern safe drinking water, substances control, land reuse and revitalization, remediation, restoration, and methamphetamine contaminated cleanups. California HSC sections 17920.10 and 105256 pertain to hazards and hazardous materials containing lead

California Code of Regulations Title 22 and Title 26

The California Code of Regulations (CCR) Title 22 provides state regulations for hazardous materials, and CCR Title 26 provides regulation of hazardous materials management. In 1996, Cal EPA established the "Unified Hazardous Waste and Hazardous Materials Management Regulatory Program" (Unified Program) which consolidated the six administrative components of hazardous waste and materials into one program.

California Hazardous Substance Account Act

The California equivalent to CERCLA, the Carpenter-Presley-Tanner Hazardous Substance Account Act (California Health and Safety Code, Chapter 6.8), was adopted in 1999. This act requires past and present owners and operators to assume liability for the remediation of hazardous waste sites within California. The regulations also contain the provisions listed below.

- Response authority for releases of hazardous substances, including spills and hazardous waste disposal sites.
- Compensation for medical expenses and lost wages or business income resulting from injuries caused by exposure to releases of hazardous substances.
- Funds for the State to assure payment of its 10% share of the costs mandated pursuant to Section 104(c)(3) of the federal act (42 USC Section 9604(c)(3)).

Similar to the 1996 CERCLA amendments that encourage cleanup of contaminated sites, the California Land Reuse and Revitalization Act of 2004 was codified in the Health and Safety Code, Division 20, Chapter 6.82, Sections 25395.60–25395.105. This chapter encourages the development or redevelopment of urban properties, provides processes that ensure remediation to protect public health, safety, and the environment, and relieves innocent owners, bona fide prospective purchasers, and owners of property adjacent to contaminated sites of liabilities and responsibilities that should be borne by those who caused or contributed to the contamination.

The Health and Safety Code Section 25356.1 requires that the California DTSC prepare or approve remedial action plans for sites where hazardous substances were released to the environment if they are listed as Superfund sites. RWQCBs have the responsibility to make decisions regarding cleanup and abatement goals and objectives for the protection of water quality (Section 24.2.2.9, Water Code). RWQCBs also regulate the disposal of contaminated soil.

California Hazardous Waste Control Law

The California Hazardous Waste Control Law (California Health and Safety Code Chapter 6.5 of Division 20) is the basic hazardous waste statute in California and is administered by DTSC. This law is similar to, but generally more stringent than, RCRA, and applies to a broader range of hazardous wastes, and requires recycling and waste reduction programs. Under this law, DTSC is authorized to administer California's hazardous waste program and implement the federal program in California. CCR Title 22, Division 4.5 contains DTSC's hazardous waste regulations.

Hazardous Waste Program

Generation, transportation, treatment, storage, and disposal of characteristic and listed hazardous wastes are regulated under the Health and Safety Code Sections 25100–25250.28. As part of hazardous waste regulation, Health and Safety Code Sections 25250–25250.28 regulate PCBs in used oil and prohibit used oil recycling or reuse if the oil contains 5 parts per million or greater of PCBs.

Hazardous Materials Release Response Plans and Inventory

The Hazardous Materials Release Response Plans and Inventory (or Hazardous Materials Business Plan) was codified in the Health and Safety Code Division 20, Chapter 6.95, Sections 25500–25520. This code requires an owner or operator of a facility that handles hazardous materials in quantities equal to or greater than 55 gallons of a liquid, 500 pounds of a solid, or 200 cubic feet of compressed gas, or extremely hazardous substances above the threshold planning quantity (40 CFR Part 355, Appendix A) to inventory the hazardous materials, develop a site map, develop an emergency plan and implement a training program for employees. This information must be submitted to the statewide information management system (California Environmental Reporting System). There are state and local exemptions to hazardous materials that must be reported, which include, but are not limited to medical gases (oxygen, nitrogen and nitrous oxide) in a medical office. The purpose of the Hazardous Materials Business Plan is to prevent or minimize hazards to public health, safety and the environment from a release of hazardous material(s). Hazardous Materials Business Plans must contain information on the location, type, quantity, and health risks of hazardous materials handled, used, stored, or disposed of, which could be accidentally released into the environment. The Certified Unified Program Agency (CUPA) maintains the inventory and emergency contact information submitted by applicable businesses and facility owners and operators in a data management system and provides this information to firefighters, health officials, planners, public safety officers, health care providers, regulatory agencies, and other interested persons have access to the plans.

California Underground Storage Tank Program

The California Underground Storage Tank Program is designed to: (1) prevent contamination from the improper storage of hazardous substances stored underground, (2) ensure that existing tanks are properly maintained, inspected, tested, and upgraded, and (3) ensure that new USTs meet appropriate standards. The California regulations are codified in the Health and Safety Code, Division 20, Chapter 6.7, Sections 25280–25299.8.

Aboveground Petroleum Storage Act (APSA) of 2007

California adopted a statewide program to determine the amount and type of hazardous substances being stored in aboveground tanks under the Health and Safety Code Division 20, Chapter 6.67, Sections 25270–25270.13. APSA applies to storage tank facilities with aggregate petroleum storage capacities of 1,320 gallons or more and requires development and implementation of a SPCC Plan consistent with 40 CFR Part 112. Facilities must submit annual Tank Facility Statements and, depending on Certified Unified Program Agency (CUPA) requirements, may be required to submit to periodic inspection.

California Solid Waste

Solid waste in California is regulated under Title 14, Division 7 and Title 27, Division 2 of the California Code of Regulations (CCR). These regulations establish minimum standards for the handling and disposal of solid wastes. Both the State Water Board and the California Department of Resources Recycling and Recovery (CalRecycle) have oversight and approval authority over local enforcement agencies that permit and take enforcement action on solid waste management facilities. Public Resources Code (PRC) Sections 43200–43219, 43020, 43020.1, 43021, 43030, 43101, and 43103 govern the local enforcement agencies.

Prior to disposal at a landfill facility, contaminated solids must be properly characterized in accordance with EPA publication SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. Based on the analytical results, material will likely be classified as one of the following:

- Nonhazardous waste;
- Non-RCRA hazardous waste (state regulated);
- RCRA hazardous waste (federally regulated).

Each waste classification has unique requirements for assessment, handling, and disposal. Many options exist for the disposal of contaminated soils including treatment, recycling, and disposal at a permitted facility or landfill. Landfills in California accepting contaminated solids are classified as:

- Class I – Accepts wastes classified as RCRA hazardous by the CCR;
- Class II – Accepts hazardous waste (RCRA or non-RCRA) designated as having a lower risk, or nonhazardous waste that significantly threatens water quality;
- Class III – Accepts nonhazardous waste and inert material.

LOCAL

Certified Unified Program Agencies

Senate Bill 1082 (1993) required the establishment of a unified hazardous waste and hazardous materials management program. The result was Cal EPA's United Program, which consolidates the actions of DTSC, the SWRCB, the RWQCB's, the Office of Emergency Services (OES), and the State Fire Marshall. DTSC oversees the implementation of the hazardous waste generator and onsite treatment program, one of six environmental programs at the local level, through Certified Unified Program Agencies (CUPAs). CUPAs have authority to enforce regulations, conduct inspections, administer penalties, and hold hearings. The San Joaquin County Environmental Health Department implements the CUPA that has enforcement authority over the City of Lathrop. The San Joaquin County Environmental Health Department administers the Hazardous Material Business Plan, California Accidental Release Prevention (Cal-ARP), Aboveground Petroleum Storage

Act, Hazardous Waste Generator, Hazardous Waste Onsite Treatment (Tiered Permitting) and Underground Storage Tank program.

San Joaquin Valley Air Pollution Control District

San Joaquin Valley Air Pollution Control District (SJVAPCD) has jurisdiction over the City of Lathrop and deals with pollutants that get into the air from stationary (including fumes, dust and smoke, some asbestos) and mobile sources. SJVAPCD's mission is to improve the health and quality of life for all Valley residents through efficient, effective and entrepreneurial air quality management strategies. SJVAPCD responds to complaints about smells, answers questions about air quality management permits, and reviews development projects for compliance with air quality and greenhouse gas significance thresholds. The SJVAPCD and air quality are addressed in detail in Section 3.3, Air Quality, of this EIR.

San Joaquin County Local Hazard Mitigation Plan

The San Joaquin County Local Hazard Mitigation Plan (LHMP) provides strategies for the County and other local jurisdictions to identify and implement mitigation actions for reducing damages from various natural and technological disasters. The LHMP analyzes the risk posed to people and property by natural hazards and considers mitigation actions that the County could implement before such events, with a goal of reducing the risk to life and safety and the risk of property damage and service disruption caused by these natural hazards.

San Joaquin County Emergency Operations Plan

The San Joaquin County Emergency Operations Plan (EOP) describes the framework under which entities having legal responsibility will work-together during emergencies and major disasters when the people, their property, the economy, or the environment of San Joaquin County are negatively impacted by natural or human-caused hazards. The EOP establishes a systematic and synchronized process to facilitate emergency preparedness, promote hazard mitigation, and coordinate emergency response and disaster recovery activities and actions. The EOP identifies the primary responsibilities of San Joaquin County government before, during, and after emergencies and major disasters. It serves as the legal and conceptual framework for incident management to be utilized by the County and its various departments within the San Joaquin County Operational Area.

The County EOP is based on the National Incident Management System (NIMS) and its component parts, along with the California Standardized Emergency Management System (SEMS), including the five functional areas of incident or event management, operational coordination, planning, logistical support, and finance/administration support. The EOP serves as the basis for response as well as recovery efforts and activities within the County.

Airport Land Use Compatibility Plans

The Airport Land Use Compatibility Plan (ALUCP) for the Stockton Metropolitan Airport, last updated in May 2016 and amended in February 2018, provides guidance related to the placement of land uses near the Stockton Metropolitan Airport. The ALUCP for San Joaquin County, last updated in July 2009 and amended in January 2018, addresses the remaining five public-use airports within San Joaquin County. These documents provide guidance intended to minimize the public's exposure to excessive noise and safety hazards, as well as ensure that the approaches to airports are kept clear of structures and other conflicts that could pose an aviation safety hazard. Specifically, the ALUCPs seek to protect the public from adverse effects of aircraft noise, ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and ensure that no structures or activities adversely affect navigable airspace.

City of Lathrop General Plan

The City of Lathrop General Plan contains the following goals, policies and actions that are relevant to hazards and hazardous materials:

LAND USE ELEMENT

- Policy LU-3.5 Ensure that development within the Stockton Metropolitan Airport Influence Area (Figure 4.2-1 of the General Plan Existing Conditions Report) is consistent with the compatible uses identified in the Project Review Guidelines for the Airport Land Use Commission
- Policy LU-5.3 Require that new residential development be designed to protect residents from potential conflicts with adjacent land uses, and other features including rail corridors, and high-volume roadways.

CIRCULATION ELEMENT

- GOAL CIR-3. Support the movement of goods through trucking, rail, and other forms of freight service while maintaining quality of life for City residents.
  - Action CIR-3c Develop an enforcement program through the Police Department to enforce compliance with truck routes.

PUBLIC SAFETY ELEMENT

- GOAL PS-2. Protect the safety of life and property and prepare for urban and wildfire emergencies.
  - Policy PS-2.1 Building Fire Codes. Require that all buildings and facilities within the city comply with local, state, and federal regulatory standards such as the California Building and Fire Codes, as well as other applicable fire safety standards, to minimize the risk of fire in the city.
  - Policy PS-2.5 Roadway Design and Maintenance. Design and maintain roadways to maintain acceptable emergency vehicle response times and turning movements.
- GOAL PS-4. Protect the community from the potential for hazardous waste and materials contamination.
  - Policy PS-4.2 Reduction. Encourage producers and users of hazardous materials to reduce the amount of hazardous materials produced and used.
  - Policy PS-4.3 Storage. Require the storage of hazardous materials in safe manner.

- Policy PS-4.4 Regulations. Ensure that the LMFD continues to enforce the Uniform Fire Code relating to the use of hazardous material and require the appropriate regulations to be followed and precautions taken for the type and amount of hazard being created, used, stored, and/or disposed.
- Policy PS-4.5 Hazardous Materials Business Plan. Coordinate with the LMFD to ensure that businesses in the city which handle hazardous materials prepare and file a Hazardous Materials Business Plan (HMBP). The HMBP shall consist of general business information, basic information on the location, type, quantity, and health risks of hazardous materials, and emergency response and training plans.
- Policy PS-4.6 Cleanup Sites. Require that the hazardous material transporter and/or the party responsible for the release, coordinates with the San Joaquin County Environmental Health Department, LMFD, and other agencies as needed, to confirm that hazardous waste cleanup sites located within the city are remediated with the property owner in a manner that keeps the public safe.
- Policy PS-4.7 Emergency Response. Work with the LMFD and other responding agencies to ensure that emergency personnel respond safely and effectively to a hazardous materials incident in the city.
    - Action PS-4a As part of the development review process, require projects that result in significant risks associated with hazardous materials to include measures to address the risks and reduce the risks to an acceptable level.
    - Action PS-4b Review development proposals to address proximity of users and transporters of significant amounts of hazardous materials relative to sensitive uses, such as schools and residential neighborhoods.
    - Action PS-4c Continue to maintain and update emergency service plans, including plans for the handling of hazardous materials and rapid cleanup of hazardous materials spills.
    - Action PS-4d Continue to require the submittal of information regarding hazardous materials manufacturing, storage, use, transport, and/or disposal by existing and proposed businesses and developments to the LMFD.
    - Action PS-4e Coordinate with the LMFD and 911 dispatch center to ensure that the City maintains a current database of hazardous materials.
    - Action PS-4f Educate current and future property owners about contamination from previous uses. The City shall coordinate with property owners in the cleanup of these sites, particularly in areas with redevelopment potential.
    - Action PS-4g Coordinate with the LMFD, other local agencies, Union Pacific Railroad, and other transporters to strictly regulate and enforce the use, storage, transport, and/or disposal of hazardous materials under California Administrative Code Title 19 requirements.

- Action PS-4j Cooperate fully with Union Pacific Railroad, LMFD, and other agencies, such as the California Highway Patrol, in the event of a hazardous material emergency.

- GOAL PS-5. Prepare and equip the community to handle emergency situations, in order to minimize loss of life, injury, property damage, and disruption of vital services.
  - Policy PS-5.1 Emergency Operations Plan. Continue to maintain and update the Emergency Operations Plan.
  - Policy PS-5.5 Emergency Evacuation Routes and Access. Work with the LMFD and the Lathrop Police Department to maintain, update, and regularly exercise emergency access, protocols, and evacuation routes to assess their effectiveness.
  - Policy PS-5.6 Automatic and Mutual Aid. Continue to participate in automatic and mutual aid agreements with adjacent service providers to ensure efficient and adequate resources, facilities, and support services during and after emergencies.
    - Action PS-5a Update, then regularly practice implementation of the City's Emergency Response Plan. Regularly review County and State emergency response procedures that must be coordinated with City procedures. Ensure that the Emergency Response Plan is posted to the City website.
    - Action PS-5e Periodically review, maintain, and repair City roadways and emergency access routes, and provide signage, where necessary, to clearly identify emergency access routes.

City of Lathrop Municipal Code

Lathrop Municipal Code Chapter 2.32, *Emergency Services Organization*, provides for the preparation and carrying out of plans for the protection of persons and property within the City in the event of an emergency; the direction of the emergency organization; and the coordination of the emergency functions of the City with all other public agencies, corporations, organizations and affected private persons.

Municipal Code Chapter 8.16, *Garbage Collection and Disposal*, establishes protocols for the proper collection and disposal of solid waste. Section 8.16.050, Hazardous Materials, prohibits the disposal of toxic or other hazardous materials into containers used for solid waste.

Municipal Code Chapter 10.16, *Truck Routes and Commercial Vehicles*, designates truck routes within the City for the movement of vehicles exceeding a maximum gross weight limit of five tons.

Municipal Code Chapter 13.28, *Stormwater Management and Discharge Control,* establishes minimum stormwater management requirements and controls to assist in the protection and enhancement of the water quality of watercourses, water bodies, and wetlands in a manner pursuant to and consistent with the Federal Clean Water Act (33 U.S.C. Sections 1251 et seq.), by reducing pollutants in stormwater discharges to the maximum extent practicable. This chapter includes provisions to prevent and respond to illegal discharges or the discharge of pollutants into stormwater, the storm drain system, or waters of the United States.

Municipal Code Title 15, *Buildings and Construction*, monitors and regulates buildings in the City through the establishment of construction, operation, and maintenance provisions. This title adopts the 2022 California Building Standards Code (CBSC), including the California Building Code (CBC), the California Residential Code, the California Plumbing Code, the California Energy Code, and the California Green Building Standards Code (Cal Green), with local amendments.

3.8.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed Project would have a significant impact from hazards and hazardous materials if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; and/or
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

METHODOLOGY AND ASSUMPTIONS

De Novo Planning Group conducted a search of various agency databases for the proposed Project site and known contaminated sites in the vicinity. This information was used to determine if construction activities associated with the proposed project could encounter known contamination. The analysis also considers the range and nature of foreseeable hazardous materials use, storage, and disposal resulting from development of the Project and identifies the primary ways that these hazardous materials could expose individuals or the environment to health and safety risks. The Project proposes predominantly residential uses and would be limited by zoning to those uses that use minimal amounts of hazardous materials. Compliance with applicable federal, State, and local health and safety laws and regulations by residents and workers within the Project site is assumed in this analysis, and local and State agencies would be expected to continue to enforce applicable requirements to the extent that they do so now.

CEQA TOPICS REQUIRING NO FURTHER ANALYSIS

As discussed in the Initial Study prepared for the proposed Project, the Project site and surrounding area are not located within an area identified as a fire hazard severity zone by the Fire Hazard Severity Zones Maps prepared by Cal Fire.[11] Impacts related to the exposure of people or structures to wildland fires would be less than significant, and no additional analysis of this CEQA topic is warranted. As such, this CEQA topic is not relevant to the proposed Project and does not require further analysis. This topic will not be further discussed.

IMPACTS AND MITIGATION

Impact 3.8-1: Implementation of the proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (Less than Significant)

Generally, the exposure of persons to hazardous materials could occur in the following manners: 1) improper handling or use of hazardous materials or hazardous wastes during construction or operation of future development, particularly by untrained personnel; 2) an accident during transport; 3) environmentally unsound disposal methods; or 4) fire, explosion or other emergencies. The severity of potential effects varies with the activity conducted, the concentration and type of hazardous material or wastes present, and the proximity of sensitive receptors.

SHORT-TERM CONSTRUCTION IMPACTS

Construction activities would occur in phases through the development of the proposed Project. Construction activities associated with development of the proposed Project may involve the routine transport, use, or disposal of hazardous materials, such as paints, sealants, lubricants, solvents, adhesives, cleaners, or petroleum-based fuels or hydraulic fluid used for construction equipment. The construction contractor would be required to use standard construction controls and safety procedures that would avoid and minimize the potential for hazards associated with the transport and use of hazardous materials. Standard construction practices would be observed such that any materials released are appropriately contained and remediated as required by local, State, and federal law. These activities would also be short-term and would cease upon completion of construction.

The use, storage, transport, and disposal of construction-related hazardous materials would be required to conform to existing laws and regulations. Compliance with applicable laws and regulations governing the use, storage, transportation, and disposal of hazardous materials would ensure all potentially hazardous materials are used and handled in an appropriate manner and would minimize the potential for safety impacts. For example, all spills or leakage of petroleum products during construction activities are required to be immediately contained, the hazardous

---

[11] Cal Fire, Fire Hazard Severity Zone Maps, 2008. Available: https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones/fire-hazard-severity-zones-maps. Accessed: March 10, 2024.

material identified, and the material remediated in compliance with applicable State and local regulations for the cleanup and disposal of that contaminant. All contaminated waste would be required to be collected and disposed of at an appropriately licensed disposal or treatment facility. As such, impacts in this regard would be ***less than significant***.

LONG-TERM OPERATIONAL IMPACTS

Implementation of the Project would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements. The operational phase of the Project would occur after construction is completed and residents move in to occupy the residential structures on a day-to-day basis. The Project does not propose uses that would involve the use or storage of hazardous substances other than limited quantities of hazardous materials such as solvents, fertilizers, pesticides, and other materials used for regular household maintenance of buildings and landscaping. The quantities of these materials would not typically be at an amount that would pose a significant hazard to the public or the environment. While the risk of exposure to hazardous materials cannot be eliminated, measures can be implemented to reduce risk to acceptable levels.

The use, storage, transport, and disposal of hazardous materials would be governed by existing regulations of several agencies, including the DTSC, EPA, DOT, Cal OSHA, the San Joaquin County Environmental Health Department, and the Lathrop-Manteca Fire Protection District (LMFD). Compliance with applicable laws and regulations governing the use, storage, transportation, and disposal of hazardous materials would ensure all potentially hazardous materials are used and handled in an appropriate manner and would minimize the potential for safety impacts. Therefore, long-term operation of the proposed Project is not anticipated to result in substantial hazards to the public or the environment arising from the routine use, storage, transport, and disposal of hazardous materials; impacts in this regard would be ***less than significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required

Impact 3.8-2: Implementation of the proposed Project, with mitigation, would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (Less Than Significant With Mitigation)

SHORT-TERM CONSTRUCTION IMPACTS

Construction activities associated with the proposed Project could release hazardous materials into the environment through reasonably foreseeable upset and accident conditions. As discussed above in Impact 3.8-1, potentially hazardous materials with the potential of accidental release may be used during future construction activities associated with Project implementation, including substances such as paints, sealants, lubricants, solvents, adhesives, cleaners, or petroleum-based fuels or hydraulic fluid used for construction equipment. The level of risk associated with the accidental release of hazardous substances is not considered significant due to the small volume and low concentration of hazardous materials utilized during construction. These activities would also be short-term and would cease upon completion of construction. Compliance with existing regulatory requirements would ensure construction workers and the general public are not exposed to significant risks related to hazardous materials during construction activities. Cal OSHA has regulations concerning the use of hazardous materials, including requirements for safety training, exposure warnings, availability of safety equipment, and preparation of emergency action/prevention plans. For example, all spills or leakage of petroleum products during construction activities are required to be immediately contained, the hazardous material identified, and the material remediated in compliance with applicable State and local regulations for the cleanup and disposal of that contaminant. All contaminated waste encountered would be required to be collected and disposed of at an appropriately licensed disposal or treatment facility.

Contractors associated with Project construction activities would be required to comply with Cal EPA's Unified Program; regulated activities would be managed by San Joaquin County Environmental Health Department, the designated CUPA for the City, in accordance with the regulations included in the Unified Program (e.g., hazardous materials release response plans and inventories, California hazardous material management plans and inventories).

Demolition of the existing on-site structures could expose construction personnel and the public to lead-based paints or ACMs. Federal and State regulations govern the renovation and demolition of structures where ACMs and lead-based paints are present. All demolition that could result in the release of ACMs or lead-based paint must be conducted according to federal and State standards. Prior to demolition activities, asbestos containing building materials which may be damaged and become friable must be removed from the building by a licensed asbestos removal contractor and transferred to a waste facility that will accept asbestos waste. A California certified asbestos removal contractor would be utilized for the removal work and proper removal methodology as outlined in all applicable federal, State, and local regulations regarding the removal, transport and disposal of ACM must be applied.

Due to the presence of existing on-site residential structures, there exists the possibility that the Project site contains underground well(s) and/or septic system(s). Any on-site well or septic system would be required to be properly destroyed or removed in accordance with State, County, and City standards and regulations.

Like most agricultural and farming operations in the Central Valley, agricultural practices in the area have used agricultural chemicals including pesticides and herbicides as a standard practice. Although no contaminated soils have been identified in the Project area or the vicinity above applicable levels, residual concentrations of pesticides may be present in soil as a result of historic agricultural application and storage. Continuous spraying of crops over many years can potentially result in a residual buildup of pesticides in farm soils. Of highest concern relative to agrichemicals are chlorinated herbicides, organophosphate pesticides, and organochlorine pesticides, such as such as MCPP, Dinoseb, chlordane, DDT, and DDE. Project construction activities would involve demolition, land clearing, mass grading, and other ground-disturbing activities that could expose contaminated soils. As such, this is a ***potentially significant*** impact.

LONG-TERM OPERATIONAL IMPACTS

Implementation of the Project would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements. The Project does not propose uses that would involve the use or storage of hazardous substances other than limited quantities of hazardous materials such as solvents, fertilizers, pesticides, and other materials used for regular household maintenance of buildings and landscaping. The quantities of these materials would not typically be at an amount that would pose a significant hazard to the public or the environment. While the risk of exposure to hazardous materials cannot be eliminated, measures can be implemented to reduce risk to acceptable levels. Adherence to existing regulations would ensure compliance with safety standards related to the use and storage of hazardous materials, and the safety procedures mandated by applicable federal, State, and local laws and regulations would minimize the potential for upset and accident conditions to occur within the site. Thus, the proposed Project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment and this impact would be ***less than significant***.

MITIGATION MEASURE(S)

Mitigation Measure 3.8-1*: In the event that hazardous materials are encountered during construction, a Soils Management Plan (SMP) shall be submitted and approved by the San Joaquin County Department of Environmental Health. The SMP shall establish management practices for handling hazardous materials, including fuels, paints, cleaners, solvents, etc., during construction. The approved SMP shall be posted and maintained onsite during construction activities and all construction personnel shall acknowledge that they have reviewed and understand the plan.*

Mitigation Measure 3.8-2*: Prior to initiation of any ground disturbance activities, evenly distributed soil samples shall be conducted throughout the Project site for analysis of pesticides and heavy metals. The samples shall be submitted for laboratory analysis of pesticides and heavy metals per DTSC and EPA protocols. The results of the soil sampling shall be submitted to the City of Lathrop and the San Joaquin County Environmental Health Department. If elevated levels of pesticides or heavy metals are detected during the laboratory analysis of the soils, a soil cleanup and remediation plan shall be prepared and implemented prior to the commencement of grading activities.*

SIGNIFICANCE AFTER MITIGATION

Less than Significant.

Mitigation Measure 3.8-1 requires that, in the event that hazardous materials are discovered during Project construction activities, a Soils Management Plan (SMP) would be submitted and approved by the San Joaquin County Environmental Health Department. The SMP would establish management practices for handling hazardous during construction. Such compliance would reduce the potential for accidental release of hazardous materials during construction of the proposed Project. As a result, it would lessen the risk of exposure of construction workers and the public to accidental release of hazardous materials, as well as the demand for incident emergency response.

Mitigation Measure 3.8-2 requires evenly distributed soil samples to be conducted within the Project site for analysis of pesticides and heavy metals prior to initiation of any ground disturbance activities. If elevated levels of pesticides or heavy metals are detected during the laboratory analysis of the soils, the Project applicant would be required to prepare and implement a soil cleanup and remediation plan prior to the commencement of grading activities. Implementation of Mitigation Measure 3.8-2 would ensure that development of the proposed Project on active agricultural land would not result in accidental release of or exposure to hazardous materials.

Compliance with standard construction practices and the existing regulatory requirements, and implementation of Mitigation Measures 3.8-1 through 3.8-2, would reduce potential impacts of the proposed Project to create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment to a less-than-significant level by ensuring that on-site soils are sampled prior to ground disturbance and that any potentially hazardous materials encountered during construction would be handled appropriately.

Impact 3.8-3: Implementation of the proposed Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. (No Impact)

There are no schools located within one-quarter mile of the Project site. The nearest school, Mossdale Elementary School, is located approximately 0.4 miles southeast of the eastern Project site boundary. Therefore, ***no impact*** would occur related to emitting hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

No Impact

MITIGATION MEASURE(S)

None required

Impact 3.8-4: Implementation of the proposed Project would not result in impacts from being included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. (No Impact)

Government Code Section 65962.5, commonly referred to as the "Cortese List," requires the DTSC and the SWRCB to compile and update a regulatory sites list (pursuant to the criteria of the Section). As previously discussed, a search of relevant agency databases concluded that the proposed Project site is not located on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. As such, implementation of the proposed Project would have ***no impact*** with regards to this environmental issue.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

No Impact

MITIGATION MEASURE(S)

None required

Impact 3.8-5: The proposed Project would not be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, resulting in a safety hazard or excessive noise for people residing or working in the Project site. (No Impact)

There are no private or public airport facilities within the City. The nearest regional public use airport is the Stockton Metropolitan Airport, located approximately six miles to the northeast, in the city of Stockton. As previously stated, the Project site is not located within the airport influence area for the Stockton Metropolitan Airport, nor is it located within two miles of a public airport or public use airport. As such, implementation of the proposed Project would have ***no impact*** with regards to this environmental issue.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

No Impact

MITIGATION MEASURE(S)

None required

Impact 3.8-6: Implementation of the proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (Less than Significant)

Implementation of the Project would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements. The Project would include construction of new on-site arterial streets, collector streets, and local streets to serve the proposed development, and would include roadway improvements to existing roadways adjacent to the Project site. Development would be designed, constructed, and maintained in accordance with applicable City standards, including vehicular access to ensure that adequate emergency access and evacuation would be maintained. Access for emergency vehicles would be required to be incorporated into Project design. Construction activities that may temporarily restrict vehicular traffic would be required to implement appropriate measures to facilitate the passage of persons and vehicles through/around any required road closures.

The Project would not impair or physically interfere with an adopted emergency response plan or emergency evacuation plan. Fire and emergency services at the Project site are provided by the LMFD. Development of the Project would be required to comply with applicable City codes and regulations pertaining to emergency response and evacuation plans. Prior to construction, proposed site plans would be required to undergo review by the LMFD to ensure that adequate emergency access would be maintained within the area. The Project would also be required to comply with all applicable codes and ordinances for emergency access, including resolving any deficiencies in access that could preclude emergency evacuation or emergency response identified by the LMFD. During Project operation, the EOP would be implemented and emergency response and evacuation would occur dependent upon the emergency situation, consistent with the EOP. Therefore, the Project would not impair implementation of or physically interfere an adopted emergency response plan or emergency evacuation plan; impacts would be ***less than significant*** with regards to this environmental issue.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

No Impact

MITIGATION MEASURE(S)

None required

This section describes the regulatory setting, regional hydrology and water quality, impacts that are likely to result from project implementation, and measures to reduce potential impacts to water quality. This section is based in part on the following documents, reports and studies: *City of Lathrop General Plan* (City of Lathrop, 2022), *Draft Environmental Impact Report for the Lathrop General Plan Update* (City of Lathrop, 2022), *Tracy Subbasin Groundwater Sustainability Plan* (2021), *2020 Urban Water Management Plan* (2021), *Water System Master Plan* (2018), *California's Groundwater Bulletin 118, San Joaquin Valley Groundwater Basin, Eastern San Joaquin Subbasin* (DWR, 2006), *California's Groundwater* (DWR, 2003), and *Web Soil Survey* (NRCS, 2023).

One comment was received during the public review period or scoping meeting for the Notice of Preparation regarding this topic from the Central Valley Regional Water Quality Control Board (RWQCB) (April 22, 2024). This comment is addressed within this section. Full comments received are included in Appendix A.

3.9.1 ENVIRONMENTAL SETTING

REGIONAL HYDROLOGY

Lathrop is located in the San Joaquin River watershed. The San Joaquin River is about 300 miles long. It begins in the Sierra Nevada mountain range on California's eastern border. The river runs down the western slope of the Sierra and flows roughly northwest through the Central Valley, to where it meets the Sacramento River at the Sacramento-San Joaquin Delta, a 1,000-square-mile maze of channels and islands that drains more than 40 percent of the state's lands (SJRGA 2013).

Because the Central Valley receives relatively little rainfall (12 to 17 inches a year, falling mostly October through March), snowmelt runoff from the mountains is the main source of fresh water in the San Joaquin River. Over its 300-mile length, the San Joaquin River is fed by many other streams and rivers, most notably the Stanislaus, Tuolumne, and Merced Rivers.

Most of the surface water in the upper San Joaquin River is stored and diverted at Millerton Lakes' Friant Dam, near Fresno. From Friant Dam, water is pumped north through the Madera Canal and south through the Friant-Kern canal to irrigation districts and other water retailers, which then deliver the water directly to the end users in the southern portion of the watershed.

In the central and northern portions of the watershed, many agricultural and municipal users receive water from irrigation districts, such as the Modesto, Merced, Oakdale, South San Joaquin and Turlock Irrigation Districts. That water is provided through diversions from rivers that are tributary to the San Joaquin, such as the Mokelumne, Stanislaus, Tuolumne and Merced Rivers.

In an average year, about 1.5 million acre-feet of water is diverted from the San Joaquin River at Friant Dam, leaving little flow in the river until the Merced River joins the San Joaquin northwest of the City of Merced. Additional water also reaches the river via flows returning to the river from municipal wastewater treatment plants, as well as urban and agricultural runoff. The rest of the area's water supply needs are met by importing water from northern California (via the Central Valley Project) and by pumping water from the groundwater basin (SJRGA 2013).

CLIMATE

Lathrop has an inland Mediterranean climate with warm, dry summers and cooler winters. The average daily maximum temperature in the Basin is 65 degrees Fahrenheit (°F), with average temperature highs of 95 °F in July. Average daily minimum temperature is 48 °F, with average temperature lows of 45 °F in January. Normal rainfall level is approximately 9 inches per year, and occurs mainly in the winter months from November to April. Thunderstorms occur on approximately three to four days in the spring, on average.

Lathrop has warm, dry days and relatively cool nights, with clear skies and limited rainfall. Winters are mild with light rains and frequent heavy fog from December to January. In summer, high temperatures often exceed 100 degrees, with averages in the low 90's in the northern valley and the high 90's in the southern valley. Summer low temperatures average in the high 50's in the northern valley and the upper 60's in the southern valley. Lathrop receives approximately 20 inches of rain per year.

WATERSHEDS

A watershed is a region that is bound by a divide that drains to a common watercourse or body of water. Watersheds serve an important biological function, oftentimes supporting an abundance of aquatic and terrestrial wildlife including special status species and anadromous and native local fisheries. Watersheds provide conditions necessary for riparian habitat.

The State uses a hierarchical naming and numbering convention to define watershed areas for management purposes. This means that boundaries are defined according to size and topography, with multiple sub-watersheds within larger watersheds. Table 3.9-1 shows the primary watershed classification levels used by the State of California. The second column indicates the approximate size that a watershed area may be within a particular classification level, although variation in size is common.

TABLE 3.9-1: STATE OF CALIFORNIA WATERSHED HIERARCHY NAMING CONVENTION

Watershed Level	*Approximate Square Miles (Acres)*	*Description*
Hydrologic Region (HR)	12,735 (8,150,000)	Defined by large-scale topographic and geologic considerations. The State of California is divided into ten HRs.
Hydrologic Unit (HU)	672 (430,000)	Defined by surface drainage; may include a major river watershed, groundwater basin, or closed drainage, among others.
Hydrologic Area (HA)	244 (156,000)	Major subdivisions of hydrologic units, such as by major tributaries, groundwater attributes, or stream components.
Hydrologic Sub-Area (HSA)	195 (125,000)	A major segment of an HA with significant geographical characteristics or hydrological homogeneity.

SOURCE: CALWATER, CALIFORNIA INTERAGENCY WATERSHED MAPPING COMMITTEE, 2008.

Hydrologic Region

San Joaquin County is located in the San Joaquin River Hydrological Region. The San Joaquin River is the principal river of the region, and all other streams of the region are tributary to it. The Mokelumne River and its tributary the Cosumnes River originate in the central Sierra Nevada, along with the more southerly Stanislaus and Tuolumne rivers. The Merced River flows from the south-central Sierra Nevada and enters the San Joaquin near the City of Newman. The Chowchilla and Fresno rivers also originate in the Sierra south of the Merced River and trend westward toward the San Joaquin River. Creeks originating in the Coast Range and draining eastward into the San Joaquin River include Del Puerto Creek, Orestimba Creek, and Panoche Creek. Del Puerto Creek enters the San Joaquin near the City of Patterson, and Orestimba Creek enters north of the City of Newman. During flood years, Panoche Creek may enter the San Joaquin River or the Fresno Slough near the town of Mendota. The King's River is a stream of the Tulare Lake Hydrologic Region, but in flood years it may contribute to the San Joaquin River, flowing northward through the James Bypass and Fresno Slough to enter near the City of Mendota. The Mud, Salt, Berrenda, and Ash Sloughs also add to the San Joaquin River, and numerous lesser streams and creeks also enter the system, originating in both the Sierra Nevada and the Coast Range. The entire San Joaquin River system drains northwesterly through the Delta to Suisun Bay (DWR 2013, pg. SJR-5).

Local Watershed

The Project site is located in the Lone Tree Creek-San Joaquin River watershed, as shown on Figure 3.9-1.

LOCAL DRAINAGE

The City provides and maintains a system of storm drains, detention basins, and pumping facilities as well as monitoring and control of the operations of the storm drain system. Additionally, the City enforces storm drain regulations established by the US EPA and the State of California.

The City of Lathrop's storm drainage collection system uses pipelines, surface channels and, in some locations, detention basins that store peak flows to direct drainage to the San Joaquin River. The City's documented existing storm drain infrastructure includes approximately 916 inlets, 691 manholes, 21 pump stations, 4 outfalls to the San Joaquin River, 13 detention basins, and 36 miles of storm drain (J.B. Anderson, 2016).

STORMWATER QUALITY

Potential hazards to surface water quality include the following nonpoint pollution problems: high turbidity from sediment resulting from erosion of improperly graded construction projects, concentration of nitrates and dissolved solids from agriculture or surfacing septic tank failures, contaminated street and lawn run-off from urban areas, and warm water drainage discharges into cold water streams.

The most critical period for surface water quality is following a rainstorm which produces significant amounts of drainage runoff into streams at low flow, resulting in poor dilution of contaminates in the low flowing stream. Such conditions are most frequent during the fall at the beginning of the rainy season when stream flows are near their lowest annual levels. Besides the greases, oils, pesticides, litter, and organic matter associated with such runoff, heavy metals such as copper, zinc, and cadmium can cause considerable harm to aquatic organisms when introduced to streams in low flow conditions.

Urban stormwater runoff was managed as a non-point discharge (a source not readily identifiable) under the Federal Water Pollution Control Amendments of 1972 (PL 92-500, Section 208) until the mid-1980's. However, since then, the Federal Environmental Protection Agency has continued to develop implementing rules which categorize urban runoff as a point source (an identifiable source) subject to National Pollution Discharge Elimination System (NPDES) permits. Rules now affect medium and large urban areas, and further rulemaking is expected as programs are developed to meet requirements of Federal water pollution control laws.

Surface water pollution is also caused by erosion. Excessive and improperly managed grading, vegetation removal, quarrying, logging, and agricultural practices all lead to increased erosion of exposed earth and sedimentation of watercourses during rainy periods. In slower moving water bodies these same factors often cause a buildup of siltation, which ultimately reduces the capacity of the water system to percolate and recharge groundwater basins, as well as adversely affecting both aquatic resources and flood control efforts.

303(d) Impaired Water Bodies

Water quality in Lathrop is governed by the CVRWQCB, which set water quality standards in their Water Quality Control Plan for the respective basins (Basin Plans). The Basin Plans identify beneficial uses for surface water and groundwater and establish water quality objectives to attain those beneficial uses.

Section 303(d) of the federal CWA requires States to identify waters that do not meet water quality standards or objectives and thus, are considered "impaired." Once listed, Section 303(d) mandates prioritization and development of a Total Maximum Daily Load (TMDL). The TMDL is a tool that establishes the allowable loadings or other quantifiable parameters for a waterbody and thereby the basis for the States to establish water quality-based controls. The purpose of TMDLs is to ensure that beneficial uses are restored and that water quality objectives are achieved.

According to the California Water Quality Control Monitoring Council, which is part of California Environmental Protection Agency, Natural Resources, there are many areas within the San Joaquin County which are considered Section 303(d) impaired waterbodies. Those areas in the city and in the regional vicinity of the Planning Area that are impaired are referred to as Delta Waterways (Southern Portion) by the Water Quality Control Monitoring Council. This includes 3,125 acres listed as early as 1996 for Chlorpyrifos (Agriculture, Urban Runoff/Storm Sewers), DDT (Agriculture), Diazinon (Agriculture, Urban Runoff/Storm Sewers), Electrical Conductivity (Agriculture), Group A Pesticides (Agriculture), Invasive Species (Source Unknown), Mercury (Resource Extraction), and Unknown Toxicity (Source Unknown).

The City of Lathrop, in collaboration with San Joaquin County, Tracy. Lodi, Manteca, and Patterson prepared a Multi-Agency Post-Construction Stormwater Standards Manual to provide consistent guidance for municipal workers, developers and builders in implementing the requirements under the Statewide Small MS4 NPDES permit (2013-0001-DWQ).

Storm water runoff may play a role in the water quality impairments described above. Runoff that occurs as overland flow across yards, driveways, and public streets is intercepted by the storm water drainage system and conveyed to local drainages before eventually being routed to the Pacific. This storm water can carry pollutants that can enter the local waterways and result in the types of water quality impairments described above. Common sources of storm water pollution in the city include litter, trash, pet waste, paint residue, organic material (yard waste), fertilizers, pesticides, sediments, construction debris, metals from automobile brake pad dust, air pollutants that settle on the ground or attach to rainwater, cooking grease, illegally dumped motor oil, and other harmful fluids.

Potential hazards to surface water quality include the following nonpoint pollution problems: high turbidity from sediment resulting from erosion of improperly graded construction projects, concentration of nitrates and dissolved solids from agriculture or surfacing septic tank failures, contaminated street and lawn run-off from urban areas, and warm water drainage discharges into cold water streams.

The most critical period for surface water quality is following a rainstorm which produces significant amounts of drainage runoff into streams at low flow, resulting in poor dilution of contaminates in the low flowing stream. Such conditions are most frequent during the fall at the beginning of the rainy season when stream flows are near their lowest annual levels. Besides the greases, oils, pesticides, litter, and organic matter associated with such runoff, heavy metals such as copper, zinc, and cadmium can cause considerable harm to aquatic organisms when introduced to streams in low flow conditions.

Urban stormwater runoff was managed as a non-point discharge (a source not readily identifiable) under the Federal Water Pollution Control Amendments of 1972 (PL 92-500, Section 208) until the mid-1980's. However, since then, the Federal Environmental Protection Agency has continued to develop implementing rules which categorize urban runoff as a point source (an identifiable source) subject to NPDES permits. Rules now affect medium and large urban areas, and further rulemaking is expected as programs are developed to meet requirements of Federal water pollution control laws.

Surface water pollution is also caused by erosion. Excessive and improperly managed grading, vegetation removal, quarrying, logging, and agricultural practices all lead to increased erosion of exposed earth and sedimentation of watercourses during rainy periods. In slower moving water bodies these same factors often cause a buildup of siltation, which ultimately reduces the capacity of the water system to percolate and recharge groundwater basins, as well as adversely affecting both aquatic resources and flood control efforts.

GROUNDWATER

In February 2019 DWR approved a Basin Boundary Modification Request that incorporates all of the City of Lathrop in the Tracy Subbasin and removes the City from the Eastern San Joaquin Subbasin. The City has coordinated with the Tracy Subbasin Groundwater Sustainability Agencies (GSA) to develop a Groundwater Sustainability Plan (GSP) that needs to be adopted and submitted to DWR by January 31, 2022. The GSP was adopted by the City of Lathrop GSA on December 13, 2021. The Tracy Subbasin is not adjudicated, nor are any of the neighboring subbasins.

The Tracy Subbasin encompasses an area of about 238,429 acres (370 square miles) in San Joaquin and Alameda counties, primarily between the eastern extent of the Coast Ranges on the south and the San Joaquin River on the east. The Subbasin is bounded on the north and east by the San Joaquin River, on the south by the San Joaquin-Stanislaus counties border, and on the west by the aerial extent of sedimentary deposits bounded by the Coastal Ranges. The San Joaquin, Old, and Middle rivers are the principal rivers within or bordering the subbasin.

Most of the groundwater pumping occurs in the area south of Old River and east of the San Joaquin River within Lathrop. North of the Old River, surface water from the Sacramento-San Joaquin Delta, is used to meet most of the water demand. The bottom of the Subbasin is the base of fresh water which is positioned at the top of the marine sediments that contain saline water. In the Tracy Subbasin, the base of the freshwater ranges from about 400 feet to 2,000 feet beneath the Subbasin. Two principal aquifers are located with the Subbasin, an Upper confined to semi-confined aquifer and a Lower confined aquifer that are separated by a layer of clay. The Upper and Lower aquifers merge where there is an absence of the clay layer, near the southwestern portion of the Subbasin. These layers also merge north of the Old River in the northern portion of the Subbasin.

The City of Lathrop encompasses approximately 14,400 (22 square miles) of the Tracy Subbasin. Municipal water sources include groundwater pumped by five wells and treated surface water purchased from the Southern San Joaquin Irrigation District (SSJID). The surface water supplies from SSJID helps the City reduce its use of groundwater. The average water demand of the City is about 9,000 acre-feet per year (AFY) and the future buildout demand for the City is estimated at 20,000 AFY. The City's total projected groundwater supply was approximately 44 percent or 6,253 AFY in 2020. This projection is expected to increase to 7,060 AFY (47 percent) in 2028 in which the supply stays constant as the City anticipates to increase its surface water supply through buildout.

LOCAL SETTING

The Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site) is located within the West Lathrop Specific Plan (WLSP) area in the City of Lathrop, San Joaquin County, California (Figures 2.0-1 and 2.0-2 in Chapter 2.0). The site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south.

The Specific Plan Area is comprised of the following APNs (Figure 2.0-3 in Chapter 2.0):

- 191-190-74;
- 191-190-75;
- 191-190-76;
- 191-190-77;
- 191-190-78;
- 191-340-03;
- 191-610-02;
- 191-610-22;
- 191-620-50; and

- 191-620-59.

The majority of the Plan Area is currently undeveloped (Figure 2.0-4 in Chapter 2.0). There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

The elevation of the site is generally flat and ranges from approximately 14 feet to 21 feet above mean sea level (MSL). The majority of the site is flat, with slopes existing along the San Joaquin River.

FLOODPLAIN MAPPING

FEMA Flood Zones

Federal Emergency Management Agency (FEMA) mapping provides important guidance for the City in planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program (NFIP) is intended to encourage State and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the NFIP defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). The FEMA FIRM for the Project site is shown on Figure 3.9-2.

Areas that are subject to flooding are indicated by a series of alphabetical symbols, indicating anticipated exposure to flood events:

- **Zone A:** Subject to 100-year flooding with no base flood elevation determined. Identified as an area that has a one percent chance of being flooded in any given year.
- **Zone AE:** Subject to 100-year flooding with base flood elevations determined.
- **Zone AH:** Subject to 100-year flooding with flood depths between one- and three-feet being areas of ponding with base flood elevations determined.
- **500-year Flood Zone:** Subject to 500-year flooding. Identified as an area that has a 0.2 percent chance of being flooded in a given year.
- **Zone X, Area with Reduced Risk Due to Levee**: This zone includes areas that would be flooded if a 500-year flood occurred but has a reduced risk of flooding due to levee protection.

As shown in Figure 3.9-2, the Development Area is not located in the 500-year or 100-year flood zones. However, a portion of the Project site, outside of the Development Area, along the San Joaquin River is within the 100-year flood zone. The majority of the Project site is also located in the 200-year flood zone area, which is an area with reduced flood risk due to a levee.

SB 5 Flood Zones

Both State policy and recently enacted State legislation (Senate Bill 5) call for 200-year (0.5% annual chance) flood protection to be the minimum level of protection for urban and urbanizing areas in the Central Valley. Senate Bill 5 (SB5) requires that the 200-year protection be consistent with criteria used or developed by the Department of Water Resources. SB 5 requires all urban and urbanizing areas in the Sacramento and San Joaquin Valleys to achieve 200-year Urban Level of flood protection (or a finding of adequate progress toward 200-year flood protection) in order to approve development. The 200-year floodplain for the Project site, as mapped for the City of Lathrop and San Joaquin County, is also shown on Figure 3.9-2. As shown in the figure, the majority of the Project site is located in the 200-year floodplain.

RD 17 created a Joint Powers Authority (JPA) that includes San Joaquin County, Stockton, Manteca, and Lathrop to issue bonds to fund the local share of Phase 1 through 3 Improvements to the RD 17 levees. Lathrop is working with RD 17 to update that JPA to fund the local share of the needed Urban Level of Protection (ULOP) improvements to the RD 17 levees, to adopt fee programs and/or exactions paid and advanced from property owners in areas of entitled and planned development within RD17, and a new Enhanced Infrastructure Financing District. As of February 2016, Lathrop and Manteca have funded the required Urban Levee Design Criteria analysis of the RD 17 levees, identified the 200-year floodplain, calculated an estimated cost to provide the ULOP improvements, and requested State funds for the State share of this work. Lathrop will continue to work with all public agencies within RD 17 to provide for final design and construction of ULOP improvements that will allow findings of Adequate Progress toward providing ULOP as the improvements are constructed.

The San Joaquin Area Flood Control Agency (SJAFCA) is a Joint Powers Authority that was created in May 1995 for the purpose of addressing flood protection for the City of Stockton and surrounding County. On November, 16, 2017, the Joint Exercise of Powers Agreement was expanded to include the Cities of Lathrop and Manteca. SJAFCA coordinates and partners with State and Federal agencies to address FEMA's Flood Insurance Rate Maps, levee standards, and flood protection issues.

Dam Failure

The Development Area is located within the dam failure inundation area for the Don Pedro Dam. Additionally, a portion of the Project site, outside the Development Area, is within the dam failure inundation area for the Vermilion Valley Dam, Cherry Valley Dam, Huntington Lake 1 Dam, Mammoth Pool Dam, O' Shaughnessy Dam, and Shaver Lake Dam. Potential inundation from these dams are shown in Figure 3.9-3. Dam failure is generally a result of structural instability caused by improper design or construction, instability resulting from seismic shaking, or overtopping and erosion of the dam. Larger dams that are higher than 25 feet or with storage capacities over 50 AF of water are regulated by the California Dam Safety Act, which is implemented by the California Department of Water Resources, Division of Safety of Dams (DSD). The DSD is responsible for inspecting and monitoring these dams. The Act also requires that dam owners submit to the California Office of Emergency Services inundation maps for dams that would cause significant loss of life or personal injury as a result of dam failure. The County Office of Emergency Services is responsible for developing, maintaining, and implementing the Local Hazard Mitigation Plan that designates evacuation plans, the direction of floodwaters, and provides emergency information.

Stormwater Quality

Potential hazards to surface water quality include the following nonpoint pollution problems: high turbidity from sediment resulting from erosion of improperly graded construction projects, concentration of nitrates and dissolved solids from agriculture or surfacing septic tank failures, contaminated street and lawn run-off from urban areas, and warm water drainage discharges into cold water streams.

The most critical period for surface water quality is following a rainstorm which produces significant amounts of drainage runoff into streams at low flow, resulting in poor dilution of contaminates in the low flowing stream. Such conditions are most frequent during the fall at the beginning of the rainy season when stream flows are near their lowest annual levels. Besides the greases, oils, pesticides, litter, and organic matter associated with such runoff, heavy metals such as copper, zinc, and cadmium can cause considerable harm to aquatic organisms when introduced to streams in low flow conditions.

Urban stormwater runoff was managed as a non-point discharge (a source not readily identifiable) under the Federal Water Pollution Control Amendments of 1972 (PL 92-500, Section 208) until the mid-1980's. However, since then, the Federal Environmental Protection Agency has continued to develop implementing rules which categorize urban runoff as a point source (an identifiable source) subject to National Pollution Discharge Elimination System (NPDES) permits. Rules now affect medium and large urban areas, and further rulemaking is expected as programs are developed to meet requirements of Federal water pollution control laws.

Surface water pollution is also caused by erosion. Excessive and improperly managed grading, vegetation removal, quarrying, logging, and agricultural practices all lead to increased erosion of exposed earth and sedimentation of watercourses during rainy periods. In slower moving water bodies these same factors often cause a buildup of siltation, which ultimately reduces the capacity of the water system to percolate and recharge groundwater basins, as well as adversely affecting both aquatic resources and flood control efforts.

303(D) IMPAIRED WATER BODIES

Section 303(d) of the federal Clean Water Act requires States to identify waters that do not meet water quality standards or objectives and thus, are considered "impaired." Once listed, Section 303(d) mandates prioritization and development of a Total Maximum Daily Load (TMDL). The TMDL is a tool that establishes the allowable loadings or other quantifiable parameters for a waterbody and thereby the basis for the States to establish water quality-based controls. The purpose of TMDLs is to ensure that beneficial uses are restored and that water quality objectives are achieved.

According to the California Water Quality Control Monitoring Council, which is part of California Environmental Protection Agency, Natural Resources, there are many areas within the San Joaquin County which are considered Section 303(d) impaired waterbodies. Those areas in the city and in the regional vicinity of the Planning Area that are impaired are referred as Delta Waterways (Southern Portion) by the Water Quality Control Monitoring Council. This includes 3,125 acres listed as early as 1996 for Chlorpyrifos (Agriculture, Urban Runoff/Storm Sewers), DDT (Agriculture), Diazinon (Agriculture, Urban Runoff/Storm Sewers), Electrical Conductivity (Agriculture), Group A Pesticides (Agriculture), Invasive Species (Source Unknown), Mercury (Resource Extraction), and Unknown Toxicity (Source Unknown).

3.9.2 REGULATORY SETTING

There are a number of regulatory agencies whose responsibility includes the oversight of the water resources of the state and nation including the Federal Emergency Management Agency, the US Environmental Protection Agency, the State Water Resources Board, and the Regional Water Quality Control Board. The following is an overview of the federal, state and local regulations that are applicable to the proposed Project.

FEDERAL

Clean Water Act

The CWA, initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) Program. Section 402(p) requires that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit.

The CWA establishes the basic structure for regulating the discharges of pollutants into the waters of the United States and gives the US Environmental Protection Agency (EPA) the authority to implement pollution control programs. The statute's goal is to regulate all discharges into the nation's waters and to restore, maintain, and preserve the integrity of those waters. The CWA sets water quality standards for all contaminants in surface waters and mandates permits for wastewater and stormwater discharges.

The CWA also requires states to establish site-specific water quality standards for navigable bodies of water and regulates other activities that affect water quality, such as dredging and the filling of wetlands. The following CWA sections assist in ensuring water quality for the water of the United States:

CWA Section 208 requires the use of best management practices (BMPs) to control the discharge of pollutants in stormwater during construction CWA Section 303(d) requires the creation of a list of impaired water bodies by states, territories, and authorized tribes; evaluation of lawful activities that may impact impaired water bodies, and preparation of plans to improve the quality of these water bodies. CWA Section 303(d) also establishes TMDLs, which is the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards CWA Section 404 authorizes the US Army Corps of Engineers to require permits that will discharge dredge or fill materials into waters in the US, including wetlands.

In California, the EPA has designated the SWRCB and its nine RWQCBs with the authority to identify beneficial uses and adopt applicable water quality objectives.

The SWRCB is responsible for implementing the CWA and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Federal regulations allow two permitting options for storm water discharges (individual permits and general permits).

Federal Emergency Management Agency

FEMA operates the NFIP. Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. Communities are occasionally audited by the California Department of Water Resources to insure the proper implementation of FEMA floodplain management regulations.

Flood Control Act

The Flood Control Act (1917) established survey and cost estimate requirements for flood hazards in the Sacramento Valley. All levees and structures constructed per the Act were to be maintained locally but controlled federally. All rights of way necessary for the construction of flood control infrastructure were to be provided to the Federal government at no cost.

Federal involvement in the construction of flood control infrastructure, primarily dams and levees, became more pronounced upon passage of the Flood Control Act of 1936.

Flood Disaster Protection Act (FDPA)

The FDPA of 1973 was a response to the shortcomings of the NFIP, which were experienced during the flood season of 1972. The FDPA prohibited Federal assistance, including acquisition, construction, and financial assistance, within delineated floodplains in non-participating NFIP communities. Furthermore, all Federal agencies and/or federally insured and federally regulated lenders must require flood insurance for all acquisitions or developments in designated Special Flood Hazard Areas (SFHAs) in communities that participate in the NFIP.

Improvements, construction, and developments within SFHAs are generally subject to the following standards:

- All new construction and substantial improvements of residential buildings must have the lowest floor (including basement) elevated to or above the base flood elevation (BFE).
- All new construction and substantial improvements of non-residential buildings must either have the lowest floor (including basement) elevated to or above the BFE or dry-floodproofed to the BFE.
- Buildings can be elevated to or above the BFE using fill, or they can be elevated on extended foundation walls or other enclosure walls, on piles, or on columns.

- Extended foundation or other enclosure walls must be designed and constructed to withstand hydrostatic pressure and be constructed with flood-resistant materials and contain openings that will permit the automatic entry and exit of floodwaters. Any enclosed area below the BFE can only be used for the parking of vehicles, building access, or storage.

National Flood Insurance Program (NFIP)

Per the National Flood Insurance Act of 1968, the NFIP has three fundamental purposes: *Better indemnify individuals for flood losses through insurance; Reduce future flood damages through State and community floodplain management regulations; and Reduce Federal expenditures for disaster assistance and flood control.*

While the Act provided for subsidized flood insurance for existing structures, the provision of flood insurance by FEMA became contingent on the adoption of floodplain regulations at the local level.

National Pollutant Discharge Elimination System

NPDES permits are required for discharges to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, oceans, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under the Federal CWA, Title IV, Permits and Licenses, Section 402 (33 USC 466 et seq.)

The RWQCB issues these permits in lieu of direct issuance by the Environmental Protection Agency, subject to review and approval by the EPA Regional Administrator (EPA Region 9). The terms of these NPDES permits implement pertinent provisions of the Federal CWA and the Act's implementing regulations, including pre-treatment, sludge management, effluent limitations for specific industries, and anti-degradation. In general, the discharge of pollutants is to be eliminated or reduced as much as practicable so as to achieve the CWA's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the RWQCB are also Waste Discharge Requirements issued under the authority of the CWA.

These NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less and are therefore to be updated regularly. The rapid and dramatic population and urban growth in the Central Valley Region has caused a significant increase in NPDES permit applications for new waste discharges. To expedite the permit issuance process, the SWRCB has adopted several general NPDES permits, each of which regulates numerous discharges of similar types of wastes. The SWRCB has issued general permits for stormwater runoff from industrial and construction sites statewide. Stormwater discharges from industrial and construction activities in the Central Valley Region can be covered under these general permits, which are administered jointly by the SWRCB and RWQCB.

Individual projects in the City that disturb more than one acre would be required to obtain NPDES coverage under the California General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit). The Construction General Permit requires the development and implementation of a Storm Water Pollution

Prevention Plan (SWPPP) describing BMPs the discharger would use to prevent and retain storm water runoff. The SWPPP must contain a visual monitoring program; a chemical monitoring program for “non-visible” pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a waterbody listed on the 303(d) list for sediment.

Rivers and Harbors Appropriation Act of 1899

One of the country’s first environmental laws, this Act established a regulatory program to address activities that could affect navigation in Waters of the United States.

Water Pollution Control Act of 1972

The Water Pollution Control Act (WPCA) established a program to regulate activities that result in the discharge of pollutants to waters of the United States

STATE

California Fish and Wildlife Code

The California Department of Fish and Wildlife (CDFW) protects streams, water bodies, and riparian corridors through the streambed alteration agreement process under Section 1600 to 1616 of the California Fish and Game Code. The California Fish and Game Code establishes that ”an entity may not substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river stream, or lake” (Fish and Game Code Section 1602(a)) without notifying the CDFW, incorporating necessary mitigation and obtaining a streambed alteration agreement. The CDFWs jurisdiction extends to the top of banks and often includes the outer edge of riparian vegetation canopy cover.

California Code of Regulations

California Code of Regulations (CCR) Title 22, Chapter 15, Article 20 requires all public water systems to prepare a Consumer Confidence Report for distribution to its customers and to the Department of Health Services. The Consumer Confidence Report provides information regarding the quality of potable water provided by the water system. It includes information on the sources of the water, any detected contaminants in the water, the maximum contaminants levels set by regulation, violations and actions taken to correct them, and opportunities for public participation in decisions that may affect the quality of the water provided.

California Government Code

Relevant sections of the California Government Code are identified below.

SECTION 65302

Revised safety elements must include maps of any 200-year flood plains and levee protection zones within the Planning Area.

SECTION 65584.04

Any land having inadequate flood protection, as determined by FEMA or DWR, must be excluded from land identified as suitable for urban development within the planning area.

SECTION 8589.4

California Government Code §8589.4, commonly referred to as the Potential Flooding-Dam Inundation Act, requires owners of dams to prepare maps showing potential inundation areas in the event of dam failure. A dam failure inundation zone is different from a flood hazard zone under the National Flood Insurance Program (NFIP). NFIP flood zones are areas along streams or coasts where storm flooding is possible from a "100-year flood." In contrast, a dam failure inundation zone is the area downstream from a dam that could be flooded in the event of dam failure due to an earthquake or other catastrophe. Dam failure inundation maps are reviewed and approved by the California Office of Emergency Services (OES). Sellers of real estate within inundation zones are required to disclose this information to prospective buyers.

California Department of Health Services

The Department of Health Services, Division of Drinking Water and Environmental Management, oversees the Drinking Water Program. The Drinking Water Program regulates public water systems and certifies drinking water treatment and distribution operators. It provides support for small water systems and for improving their technical, managerial, and financial capacity. It provides subsidized funding for water system improvements under the State Revolving Fund ("SRF") and Proposition 50 programs. The Drinking Water Program also oversees water recycling projects, permits water treatment devices, supports and promotes water system security, and oversees the Drinking Water Treatment and Research Fund for MTBE and other oxygenates.

Consumer Confidence Report Requirements

California Code of Regulations (CCR) Title 22, Chapter 15, Article 20 requires all public water systems to prepare a Consumer Confidence Report for distribution to its customers and to the Department of Health Services. The Consumer Confidence Report provides information regarding the quality of potable water provided by the water system. It includes information on the sources of the water, any detected contaminants in the water, the maximum contaminant levels set by regulation, violations and actions taken to correct them, and opportunities for public participation in decisions that may affect the quality of the water provided.

California Water Code

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Division 7 of the California Water Code) (Porter-Cologne Act). The Porter-Cologne Act grants the SWRCB and each of the RWQCBs power to protect water quality and is the primary vehicle for implementation of California's responsibilities under the Federal CWA. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a Water Quality Control Plan (Basin Plan) for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

Assembly Bill 162

Assembly Bill (AB) 162 requires a general plan's land use element to identify and annually review those areas covered by the general plan that are subject to flooding as identified by flood plain mapping prepared by FEMA or DWR. The bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the conservation element of the general plan to identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management. By imposing new duties on local public officials, the bill creates a State-mandated local program.

This bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the safety element to identify, among other things, information regarding flood hazards and to establish a set of comprehensive goals, policies, and objectives, based on specified information for the protection of the community from, among other things, the unreasonable risks of flooding.

Assembly Bill 70

AB 70 provides that a city or county may be required to contribute its fair and reasonable share of the property damage caused by a flood to the extent that it has increased the State's exposure to liability for property damage by unreasonably approving, as defined, new development in a previously undeveloped area, as defined, that is protected by a State flood control project, unless the city or county meets specified requirements.

Senate Bill 610 and Assembly Bill 901

The State Legislature passed SB 610 and AB 901 in 2001. Both measures modified the Urban Water Management Planning Act.

SB 610 requires additional information in an urban water management plan if groundwater is identified as a source of water available to an urban water supplier. It also requires that the plan include a description of all water supply projects and programs that may be undertaken to meet total projected water use. SB 610 requires a city or county that determines a project is subject to CEQA to identify any public water system that may supply water to the project and to request identified public water systems to prepare a specified water supply assessment. The assessment must include, among other information, an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and water received in prior years pursuant to these entitlements, rights, and contracts.

AB 901 requires an urban water management plan to include information, to the extent practicable, relating to the quality of existing sources of water available to an urban water supplier over given time periods. AB 901 also requires information on the manner in which water quality affects water management strategies and supply reliability. The bill requires a plan to describe plans to supplement a water source that may not be available at a consistent level of use, to the extent practicable. Additional findings and declarations relating to water quality are required.

Senate Bill 221

SB 221 adds Government Code Section 66455.3, requiring that the local water agency be sent a copy of any proposed residential subdivision of more than 500 dwelling units within five days of the subdivision application being accepted as complete for processing by the city or county. It also adds Government Code Section 66473.7, establishing detailed requirements for establishing whether a "sufficient water supply" exists to support any proposed residential subdivisions of more than 500 dwellings, including any such subdivision involving a development agreement. When approving a qualifying subdivision tentative map, the city or county must include a condition requiring availability of a sufficient water supply. The applicable public water system must provide proof of availability. If there is no public water system, the city or county must undertake the analysis described in Government Code Section 66473.7. The analysis must include consideration of effects on other users of water and groundwater.

State Updated Model Landscape Ordinance

Under AB 1881, the updated Model Landscape Ordinance requires cities and counties to adopt landscape water conservation ordinances by January 31, 2010 or to adopt a different ordinance that is at least as effective in conserving water as the updated Model Ordinance.

Water Quality Control Basin Plan

The Water Quality Control Plan for the Sacramento-San Joaquin River Basins (Basin Plan), amended by the CVRWQCB in 2018, identifies the beneficial uses of water bodies and provides water quality objectives and standards for waters of the Sacramento River and SJR basins, including the Delta.

State and federal laws mandate the protection of designated "beneficial uses" of water bodies. State law defines beneficial uses as "domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050[f]). Additional protected beneficial uses of the SJR include groundwater recharge and freshwater replenishment.

State Water Resources Control Board Storm Water Strategy

The Storm Water Strategy is founded on the results of the Storm Water Strategic Initiative, which served to direct the State Water Board's role in storm water resources management and evolve the Storm Water Program by a) developing guiding principles to serve as the foundation of the storm water program, b) identifying issues that support or inhibit the program from aligning with the guiding principles, and c) proposing and prioritizing projects that the Water Boards could implement to address those issues.

The State Water Board staff created a strategy-based document called the Strategy to Optimize Management of Storm Water (STORMS). STORMS includes a program vision, missions, goals, objectives, projects, timelines, and consideration of the most effective integration of project outcomes into the Water Board's Storm Water Program.

REGIONAL

Tracy Subbasin Groundwater Sustainability Plan

The Sustainable Groundwater Management Act (SGMA) requires local GSAs in high- and medium-priority basins to develop and implement GSPs or to develop Alternatives to GSPs. GSPs provide a roadmap for how groundwater basins will reach long-term sustainability.

The City is located within the Tracy Subbasin as of February 2019 and has been in coordination with the GSA to develop a Groundwater Sustainability Plan (GSP). The GSP must be adopted and submitted to the DWR by January 31, 2022. The City's GSP was adopted by the City of Lathrop GSA in December 2021.

The GSP covers the entire Subbasin. The Subbasin encompasses an area of about 238,429 acres (370 square miles) in San Joaquin and Alameda counties, primarily between the eastern extent of the Coast Ranges on the south and the San Joaquin River on the east. The Subbasin is bounded on the north and the east by the San Joaquin River, on the south by the San Joaquin-Stanislaus counties border, and on the west by the aerial extent of sedimentary deposits bounded by the Coastal Ranges. Six agencies filed with DWR to become GSAs to cover the entire Subbasin. DWR designated them as exclusive in 2016 and 2017. In 2018, the Subbasin boundaries were modified which resulted in the formation of the East Contra Costa Subbasin and inclusion of the City of Lathrop areas into the Tracy Subbasin. The six GSAs in the Subbasin are: Banta-Carbona Irrigation District; Byron-Bethany Irrigation District; City of Lathrop; City of Tracy; County of San Joaquin; and Stewart Tract.

Projects and management actions were selected by the GSAs for implementation to meet measurable objectives by 2042 and to maintain groundwater levels above minimum thresholds. The Subbasin Non-Delta Management Area is projected to have a deficit of about 700 AFY based on projected changes in the Subbasin including climate change forecasted for 2065. Assessing the deficit by principal aquifer has shown the Upper aquifer has a deficit of about 800 AFY while the Lower aquifer is in surplus by 100 AFY. Because the aquifers are so close to being in balance and within the uncertainty of the model, projects are proposed for both aquifers. The project selected is to augment water supplies to resolve chronic lowering of groundwater levels and change in storage in the Upper aquifer. Management actions have been selected to limit the potential to increase surface water depletion with additional benefits towards GDEs.

LOCAL

City of Lathrop General Plan

The City of Lathrop General Plan contains the following policies that are relevant to hydrology and water quality:

POLICIES: PUBLIC SAFETY ELEMENT

- PS-3.4: Evaluate Hazards. Require evaluation of potential flood hazards prior to approval of development projects to determine whether the proposed development is reasonably safe from flooding and consistent with California Department of Water Resources Urban Level of Flood Protection Criteria (ULOP). The City shall not approve the execution of a development agreement, a tentative map, or a parcel map for which a tentative map is not required, or a discretionary permit or other discretionary entitlement that would result in the construction of a new building, or construction that would result in an increase in allowed occupancy for an existing building, or issuance of a ministerial permit that would result in the construction of a new residence for property that is located within a 200-year flood hazard zone, unless the adequacy of flood protection as described in Government Code §65865.5(a), 65962(a), or 66474.5(a), has been demonstrated.
- PS-3.7: Mitigation. Require all development projects to demonstrate how storm water runoff will be detained or retained on-site, treated, and/or conveyed to the nearest drainage facility as part of the development review process. Project applicants shall demonstrate that project implementation would not result in increases in the peak flow runoff to adjacent lands or drainage facilities that would exceed the design capacity of the drainage facility or result in an increased potential for offsite flooding.
- PS-3.8: Construction Activities. Ensure that construction activities will not result in adverse impacts to existing flood control and drainage facilities, and adequate drainage and erosion control measures are provided during construction of new development.
- PS-3.9: Adequate Infrastructure. Maintain and regularly assess the status of local storm drainage infrastructure to ensure that the system is functioning property.

POLICIES: PUBLIC FACILITIES AND SERVICES ELEMENT

- PFS-4.1: Maintain Capacity. Maintain and improve storm drainage infrastructure and flood control facilities in order to protect the community from flood hazards.
- PFS-4.2: Regional Partnerships. Continue to work cooperatively with the San Joaquin Area Flood Control Agency and other outside agencies to meet SB-5 requirements to provide a 200-year Urban Level of Protection and other needs and priorities relative to storm drainage issues. Also, continue to participate with the San Joaquin Valley Stormwater Quality Partnership to meet objectives related to compliance with the City's Small MS4 Phase 2 permit.
- PFS-4.3: Maintenance Districts. Continue to fund the operation and maintenance of stormwater facilities and regulatory compliance through the creation of maintenance districts and/or other appropriate mechanisms that avoid burdening the City's finances.
- PFS-4.4: National Programs. Cooperate in regional programs to implement the National Pollutant Discharge Elimination System program.
- PFS-4.5: Development Review. Continue to require all development projects to:
    A. Demonstrate how storm water runoff will be detained or retained on-site and/or conveyed to the nearest drainage facility as part of the development review process and as required by the City's Small MS4 Phase 2 permit; and

B. Analyze their drainage and stormwater conveyance impacts and either demonstrate that the City's existing infrastructure can accommodate increased stormwater flows, or make the necessary improvements to mitigate all potential impacts.

- PFS-4.6: Stormwater Runoff. Stormwater runoff may be directed towards permeable surfaces to the greatest extent feasible to allow for more percolation of stormwater into the ground.
- PFS-4.7: Stormwater Capture. Encourage the use of professionally designed stormwater capture methods to aid in the reuse of rainwater for non-potable uses in compliance with applicable State regulations.
- PFS-4.8: Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.
- PFS-4.9: Naturalized Stormwater Facilities. Maintain stormwater facilities in a naturalized condition where appropriate, incorporating recreational trails, parkway vegetation, and other amenities, minimizing grading, and ensuring that vegetation does not reduce channel capacity, and consistent with the Recreation and Resources Element.
- PFS-4.10: Dual-Use Detention Basins. Allow recreational uses in dual-use detention basins for parks, ball fields, and other uses where appropriate.

POLICIES: RECREATION AND RESOURCES ELEMENT

- RR-4.4: Natural Water Bodies and Drainage Systems. Limit the disturbance of natural water bodies and drainage systems in Lathrop by conserving natural open space areas, protecting channels, and minimizing the impacts from stormwater and urban runoff.
- RR-8.7: Groundwater Recharge. Promote the use of permeable surface materials and provide for ample areas of open space, including parks and greenways, and naturalized land, in order to decrease surface runoff and promote groundwater recharge.

ACTION: PUBLIC SAFETY ELEMENT

- PS-3g: Continue to review development projects to identify potential stormwater and drainage impacts and require new, unentitled development to include measures to ensure that off-site runoff is not increased during rain and flood events. As part of the development review process, require developers to prepare hydrological studies as necessary. Studies shall encompass the project site as well as the entire drainage area.

ACTIONS: PUBLIC FACILITIES AND SERVICES ELEMENT

- PFS-4d: Continue to review development projects to identify potential stormwater and drainage impacts and require development to include measures to ensure that off-site runoff is not increased beyond pre-development levels during rain and flood events.
- PFS-4e: Project designs should minimize drainage concentrations, minimize impervious coverage, utilize pervious paving materials, utilize low impact development (LID) strategies, and utilize Best Management Practices (BMPs) to reduce stormwater runoff.

- PFS-4f: Promote the use of LID strategies in new development and redevelopment projects, including but not limited to the use of canopy trees and shrubs, vegetated swales, and permeable paving.
- PFS-4g: Require new development to mitigate increases in stormwater peak flows and/or volume. Mitigation measures, such as LID strategies, should take into consideration impacts on adjoining lands in the City.

ACTION: RECREATION AND RESOURCES ELEMENT

- RR-4c: Require new development which has the potential to result in water quality impacts to the City's waterways and the local groundwater basin to implement all feasible mitigation measures to reduce impacts.

City of Lathrop Municipal Code

CHAPTER 12.28: PROTECTION OF WATER COURSES

Section 12.28.020: Rules and regulations.

A. It shall be unlawful for any person to interfere with, destroy or use in any manner whatsoever any levee, embankment, channel, dam, reservoir, rain or stream gauges, telephone line, piling; or other stream protection work constructed by the city or by any drainage district organized under the laws of the state, without having received a written permit therefor from the public works director, which permit shall be revocable whenever, in the opinion of the public works director the public interest and welfare require the revocation thereof. Application for the use of any levee, embankment, channel, dam or reservoir shall be made to the public works director, setting forth the particular use desired, and the purpose and duration thereof. The public works director shall investigate such applications and may impose such terms and conditions as may be necessary to insure the proper maintenance of the property for flood control and drainage purposes.
B. It shall be unlawful for any person to place on or cause to be placed in any drainage ditch, water course, channel or conduit, or upon any property over which the city or any drainage district has an easement for flood control or drainage purposes duly recorded in the office of the city clerk, any wires, fence, building or other structure, or any refuse, rubbish, tin cans or other matter that may impede, retard or change the direction of the flow of water in such drainage ditch, water course, channel or conduit, or that will catch or collect debris carried by such water, or is placed where the natural flow of the storm and flood waters would carry the same downstream to the damage and detriment of either private or public property adjacent to said drainage ditch, water course, channel or conduit.
C. It shall be unlawful for any person to change the drainage on his or her property so as to divert the drainage to the nearest public road, without first obtaining a permit to do so from the public works director.
D. It shall be unlawful for any person to fill or obstruct or maintain any fill or obstruction in any drainage ditch, water course, channel or conduit carrying storm or drainage water unless a permit to do so has been obtained from the public works director.

E. It shall be unlawful for any person to do anything to any drainage ditch, water course, channel or conduit carrying storm or drainage water that will in any manner obstruct or interfere with the flow of water through such ditches, water courses, channels or conduits unless a permit to do so has been obtained from the public works director.
F. It shall be unlawful for any person to level land in a manner which would flood adjacent properties or public roadways.
G. Every property owner, whether it be a person or his lessee or tenant, through whose property a drainage ditch, water course, channel or conduit carrying storm or drainage water passes, shall keep and maintain the same free from obstacles that will prevent or retard the flow of water through such ditch, water course, channel or conduit except that same may be filled or altered if a permit to do so has been first obtained pursuant to this chapter. (Prior code § 158.02)

CHAPTER 13.28 – STORMWATER MANAGEMENT AND DISCHARGE CONTROL

Section 13.28.020: Purpose and intent.

The purpose of this chapter is to establish minimum stormwater management requirements and controls to protect and safeguard the general health, safety, and welfare of the public residing in watersheds within the city of Lathrop, pursuant to and consistent with the Federal Clean Water Act (33 U.S.C. Section 1251 et seq.) and the Porter-Cologne Water Quality Act (California Water Code Section 13000 et seq.). This chapter seeks to meet that purpose through the following objectives:

A. To comply with all federal and state laws, lawful standards and orders applicable to stormwater and urban runoff pollution control;
B. To prohibit any discharge which may interfere with the operation of, or cause any damage to the storm drain system or impair the beneficial use of the receiving waters;
C. To prohibit illicit discharges into the storm drain system;
D. To reduce non-stormwater discharge to the storm drain system to the maximum extent practicable;
E. Minimize increases in stormwater and runoff from any development in order to reduce flooding, siltation, and streambank erosion and maintain the integrity of drainage channels;
F. Minimize nonpoint source pollution caused by stormwater runoff from development that would otherwise degrade local water quality; and
G. Minimize the total annual volume of surface water runoff that flows from any specific site during and following development. (Ord. 07-265 § 1)

Section 13.28.130: Requirement to prevent, control and reduce stormwater pollutants.

A.4. Authorization to Adopt and Impose Best Management Practices (BMPs). The city may adopt requirements identifying best management practices for any activity, operation, or facility which may cause or contribute to pollution or contamination of stormwater, the storm drain system, or waters of the United States. Where best management practice requirements are promulgated by the city or any federal, state of California, or regional agency for any activity, operation, or facility which would otherwise cause the discharge of pollutants to the storm drain system or a waters of the United States, every person undertaking such activity or operation, or owning or operating such facility shall comply with such requirements.

[…]

C.1. The enforcement official may require controls as appropriate to minimize the long-term, postconstruction activity discharge of stormwater pollutants from new development(s) or modifications to existing development(s). Controls may include source control measures to prevent pollution of stormwater, treatment controls designed to remove pollutants from stormwater, low impact development measures, and/or hydromodification measures to offset the difference between the pre-and post-construction peak flow runoff rates and volumes. Proponents of all applicable development and redevelopment projects will be required to meet the requirements and design standards specified in the current state of California Phase II MS4 NPDES permit and as described in further detail in the city's multi-agency post-construction stormwater standards manual.

C.2. At the earliest planning stages, project proponents shall assess and evaluate how site conditions, such as soils, vegetation, and flow paths will influence the placement of buildings and paved surfaces. The evaluation will be used to optimize the site layout to meet the goals of capturing and treating runoff. Each project proponent will submit a map of the project dividing the site into discrete drainage management areas to show in each how runoff will be managed using site design measures, source controls, treatment controls, and hydromodification measures as defined by the current MS4 permit. All site design measures, source controls, treatment controls, and hydromodification measures must be selected, sized, and situated in accordance with the guidance provided in the current MS4 permit and the city's multi-agency post-construction stormwater standards manual. Documentation of the site's post-construction stormwater design measures must be submitted to the city engineer for review and approval prior to the commencement of the project.

C.3. Project proponents must sign an operation and maintenance agreement in which they legally bind themselves to maintain the installed post-construction design measures in an effective and good operational condition until the property ownership is transferred. A written operation and maintenance plan for the proposed stormwater design measures is required to be submitted to and approved by the city with the signed agreement. The agreement will be recorded with the deed by the county clerk making it transferrable to the new owner; or, when there are multiple property owners responsible for the maintenance of the control measures, the agreement will consist of a legally binding covenant between the city and the homeowners association or maintenance district. The owner or association responsible for the maintenance of the control measures may be required by the city to submit an annual self-certification that the stormwater control measures are effective and are being maintained in accordance with the submitted and approved operation and maintenance plan.

CHAPTER 17.17 – 200-YEAR FLOOD PROTECTION

Section 17.17.010 Intent.

This chapter implements the requirements of Senate Bill 5 (2007) and related legislation that prohibit approval of urban development in urban and urbanizing areas that are exposed to 200-year flooding risk unless certain findings are made. These requirements are established in the California Government Code at Sections 65865.5, 65962 and 66474.5, as amended. (Ord. 16-361 § 1)

Section 17.17.030: 200-year flood protection requirements for new development.

After July 2, 2016, unless that date is amended by the State Legislature, new development shall not be approved where 200-year flooding, as shown on a 200-year floodplain map, will exceed three feet in depth, or in flood hazard zones where 200-year floodplain maps have not been approved by the city engineer, unless the approval authority determines based on substantial evidence in the record that:

A. The facilities of the State Plan of Flood Control or other flood management facilities protect the new development site to the urban level of flood protection in urban and urbanizing areas or the national Federal Emergency Management Agency standard of flood protection in non-urbanized areas; or
B. Conditions imposed on the new development will protect the property to the urban level of flood protection in urban and urbanizing areas or the national Federal Emergency Management Agency standard of flood protection in non-urbanized areas; or
C. The local flood management agency has made adequate progress on the construction of a flood protection system that will result in flood protection equal to or greater than the urban level of flood protection in urban or urbanizing areas, or the national Federal Emergency Management Agency standard of flood protection in non-urbanized areas, for a new development site located within a flood hazard zone intended to be protected by the system. For urban and urbanizing areas protected by project levees, the urban level of flood protection shall be achieved by 2025; or
D. The new development site located in an undetermined risk area has met the urban level of flood protection based on substantial evidence in the record. (Ord. 16-361 § 1)

City of Lathrop Stormwater Management Program

The City has an adopted a stormwater management program (SWMP) for compliance with requirements of the Phase 2 NPDES municipal stormwater permit. The SWMP is composed of six program elements developed to reduce contaminants discharged into receiving water bodies. The six Minimum Control Measure (MCM) elements of the SWMP are public education and outreach, public involvement/participation, illicit discharge detection and elimination, construction site runoff control, post construction runoff control in new development and redevelopment, and pollution prevention/good housekeeping for municipal operations. For each MCM, the City has selected a suite of BMPs and measurable goals to address the specific stormwater problems identified within the city limits.

In association with the SWMP, the City adopted a Storm Water Ordinance, construction standards, and design review guidelines to reduce contaminants in stormwater runoff. Of particular relevance to the proposed project is the City's coordination of BMP review and implementation under the construction site runoff control program. New development and redevelopment control measures include development of structural controls, development of nonstructural controls, development of ordinances or regulatory mechanisms, and development of long-term operation and maintenance (O&M) practices.

Pollution prevention/good housekeeping for municipal operations addresses routine O&M activities for drainage systems, roadways, parks and open spaces, and other municipal operations to help ensure a reduction in pollutants entering the storm sewer system. The pollution prevention/good housekeeping program also includes a training component to prevent and reduce stormwater pollution from municipal operations. The pollution prevention/good housekeeping BMPs can be separated into two broad categories: source controls and materials management.

Source controls are BMPs designed to prevent or reduce pollutants at the source and include BMPs such as storm drainage system maintenance, structural floatable controls, street maintenance staff training, flood control projects, and litter ordinances. Materials management BMPs are designed to reduce pollutants with nonstructural controls such as pesticide education and spill prevention control.

3.9.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed Project will have a significant impact on the environment associated with hydrology and water quality if it will:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would:
    - Result in substantial erosion or siltation on- or off-site;
    - Substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site;
    - Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff
    - Impede or redirect flood flows;
- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation;

- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

IMPACTS AND MITIGATION

Impact 3.9-1: The proposed Project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. (Less than Significant)

According to the United States Environmental Protection Agency, polluted stormwater runoff is a leading cause of impairment to the nearly 40 percent of surveyed U.S. water bodies which do not meet water quality standards. Over land or via storm sewer systems, polluted runoff is discharged, often untreated, directly into local water bodies. Soil erosion is one of the most common sources of polluted stormwater runoff during construction activities. When left uncontrolled, storm water runoff can erode soil and cause sedimentation in waterways, which collectively result in the destruction of fish, wildlife, and aquatic life habitats; a loss in aesthetic value; and threats to public health due to contaminated food, drinking water supplies, and recreational waterways.

Mandated by Congress under the Clean Water Act, the NPDES Stormwater Program is a comprehensive two-phased national program for addressing the non-agricultural sources of stormwater discharges which adversely affect the quality of our nation's waters. The program uses the National Pollutant Discharge Elimination System (NPDES) permitting mechanism to require the implementation of controls designed to prevent harmful pollutants, including soil erosion, from being washed by stormwater runoff into local water bodies. The construction activities for the proposed project would be governed by the General Permit 2009-0009-DWQ (amended by 2010-0014-DWQ & 2012-0006-DWQ), which states:

> *"…Particular attention must be paid to large, mass graded sites where the potential for soil exposure to the erosive effects of rainfall and wind is great and where there is potential for significant sediment discharge from the site to surface waters. Until permanent vegetation is established, soil cover is the most cost-effective and expeditious method to protect soil particles from detachment and transport by rainfall. Temporary soil stabilization can be the single most important factor in reducing erosion at construction sites. The discharger is required to consider measures such as: covering disturbed areas with mulch, temporary seeding, soil stabilizers, binders, fiber rolls or blankets, temporary vegetation, and permanent seeding. These erosion control measures are only examples of what should be considered and should not preclude new or innovative approaches currently available or being developed. Erosion control BMPs should be the primary means of preventing storm water contamination, and sediment control techniques should be used to capture any soil that becomes eroded…."*

General Permit 2009-0009-DWQ (amended by 2010-0014-DWQ & 2012-0006-DWQ) further states that:

"Sediment control BMPs should be the secondary means of preventing storm water contamination. When erosion control techniques are ineffective, sediment control techniques should be used to capture any soil that becomes eroded. The discharger is required to consider perimeter control measures such as: installing silt fences or placing straw wattles below slopes. These sediment control measures are only examples of what should be considered and should not preclude new or innovative approaches currently available or being developed…. Inappropriate management of run-on and runoff can result in excessive physical impacts to receiving waters from sediment and increased flows. The discharger is required to manage all run-on and runoff from a Specific Plan Area. Examples include: installing berms and other temporary run-on and runoff diversions…. All measures must be periodically inspected, maintained and repaired to ensure that receiving water quality is protected. Frequent inspections coupled with thorough documentation and timely repair is necessary to ensure that all measures are functioning as intended…."

CONSTRUCTION PHASE

Grading, excavation, removal of vegetation cover, and loading activities associated with construction activities could temporarily increase runoff, erosion, and sedimentation. Construction activities also could result in soil compaction and wind erosion effects that could adversely affect soils and reduce the revegetation potential at construction sites and staging areas.

To ensure that construction activities are covered under General Permit 2009-0009-DWQ (amended by 2010-0014-DWQ & 2012-0006-DWQ), projects in California with land disturbance of one-acre or more must prepare a Stormwater Pollution Prevention Plan (SWPPP) containing Best Management Practices (BMPs) to reduce erosion and sediments to meet water quality standards. Such BMPs may include: temporary erosion control measures such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover. The BMPs and overall SWPPP is submitted to the Regional Water Quality Control Board and the City as part of the permitting process. Once submitted, the SWPPP is kept on site and implemented during construction activities and must be made available upon request to representatives of the RWQCB and/or the City.

In accordance with the NPDES Stormwater Program, the Project would be subject to the existing regulatory requirements to prepare a SWPPP designed to control erosion and the loss of topsoil to the extent practicable using BMPs that the RWQCB has deemed effective in controlling erosion, sedimentation, runoff during construction activities. The RWQCB has stated that these erosion control measures are only examples of what should be considered and should not preclude new or innovative approaches currently available or being developed. The specific controls are subject to the review and approval by the RWQCB and are an existing regulatory requirement. Implementation of the proposed Project would have a ***less than significant*** impact relative to this topic.

OPERATIONAL PHASE

The long-term operations of the proposed Project (all phases) could result in long-term impacts to surface water quality from urban stormwater runoff. The proposed Project would result in increased impervious area at the site as a result of the proposed development. Normal activities in these developed areas include the use of various automotive petroleum products (i.e., oil, grease, and fuel), common household hazardous materials, heavy metals, pesticides, herbicides, fertilizers, and sediment. Within urban areas, these pollutants are generally called nonpoint source pollutants. The pollutant levels vary based on factors such as time between storm events, volume of storm event, type of uses, and density of people.

As discussed in Chapter 2.0, development of the proposed Project would include construction of a new storm drainage system. According to the Mossdale Landing Master Drainage Plan, the Mossdale Village drainage shed is divided into six sub-sheds with a combined area of 912 acres. Each sub-shed functions independently and has its own pump station, storm water quality basin or vault and flood control detention basin. Underground detention solutions are permitted to be used where appropriate. Each sub-shed is required to treat the first flush storm event, which is the volume of water equal to the 85th percentile of a 24-hour storm event. The pumps will begin to discharge water to a single outfall at the San Joaquin River (up to 30 percent of the peak discharge rate) once the first flush event has been treated. After the rain event is over, the pumps will continue to direct water to the river; however, if the San Joaquin River rises to a base flood level of 21.0 feet, the pumps will shut off until the water level in the river subsides. More information can be obtained from the Drainage Plan.

The storm drain lines in each individual residential street in Mossdale Landing West will drain towards the main line in Towne Centre Drive, which crosses River Islands Parkway and connects to an existing main near the intersection of Village Avenue. Water will then travel via gravity to the existing pump station located in the southwest corner of the Mossdale Landing Community Park, which will eventually pump the water into the San Joaquin River. Upgrades to the existing pump and storm drain system will be determined.

If an interim storm drain solution is required, a temporary detention basin can constructed near the southern border of the site to hold water until it can be slowly released to enter the existing storm drain system.

In order to meet the requirements of the NPDES General Permit for Stormwater Discharges from Small MS4s, the City has prepared a Stormwater Management Plan and adopted the 2015 Multi-Agency Post-Construction Stormwater Standards Manual. Because it is likely to undergo elevated population growth, the City must also adhere to the supplemental provisions of Attachment 4 of the General Permit, which contains design standards and receiving water restrictions that must be incorporated into the design and installation of infrastructure associated with new development. According to the General Permit, both structural and non-structural Best Management Practices (BMPs) for post-construction must be installed for any new development. Structural BMPs capture and treat the first flush runoff. Examples include grassy swales, stormwater quality basins and underground vaults. To help guarantee the proper continuing operation and maintenance of these

BMPs, operations and maintenance (O&M) manuals and recommended maintenance schedules are required. Examples of non-structural BMPs include good housekeeping and employee training.

The ongoing operational phase of the proposed project requires the eventual discharge of stormwater into the San Joaquin River. The discharge of stormwater must be treated through BMPs prior to its discharge. The Lathrop Municipal Code provides rules and regulations to manage and control stormwater and discharge (Chapter 13.28). Section 13.28.120 requires compliance with all applicable NPDES permits. Additionally, Section 13.28.130 specifically provides requirement to prevent, control, and reduce stormwater pollutants. This includes requirements to implement BMPs to the extent they are technologically achievable to prevent and reduce pollutants. Under this requirement, project proponents must sign an O&M agreement in which they legally bind themselves to maintain the installed post-construction design measures in an effective and good operational condition until the property ownership is transferred. A written O&M plan for the proposed stormwater design measures is required to be submitted to and approved by the city with the signed agreement. The agreement will be recorded with the deed by the county clerk making it transferrable to the new owner; or, when there are multiple property owners responsible for the maintenance of the control measures, the agreement will consist of a legally binding covenant between the city and the homeowners association or maintenance district. The owner or association responsible for the maintenance of the control measures may be required by the city to submit an annual self-certification that the stormwater control measures are effective and are being maintained in accordance with the submitted and approved O&M plan.

The ongoing operational phase of the proposed Project requires the final discharge of stormwater into the San Joaquin River. The discharge of stormwater must be treated through BMPs prior to its discharge. The City of Lathrop implements BMPs to the extent they are technologically achievable to prevent and reduce pollutants.

In accordance with the Mossdale Landing Master Drainage Plan, City's Storm Water Master Plan (SWMP), and NPDES General Permit for Stormwater Discharges from Small MS4s, BMPs would be implemented to reduce the amount of pollution in stormwater discharged from the project site. The management of water quality through the implementation of appropriate BMPs would ensure that water quality does not degrade to levels that would violate water quality standards. These are existing regulatory requirements. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.9-2: Project implementation would not deplete groundwater supplies or interfere substantially with groundwater recharge. (Less than Significant)

The proposed Project would result in new impervious surfaces and could reduce rainwater infiltration and groundwater recharge. Infiltration rates vary depending on the overlying soil types. In general, sandy soils have higher infiltration rates and can contribute to significant amounts of ground water recharge; clay soils tend to have lower percolation potential; and impervious surfaces such as pavement significantly reduce infiltration capacity and increase surface water runoff.

Table 3.9-2 below identifies the soils in the Project site and the soils infiltration rate. The Project site has soils with hydrologic ratings of “C”. Group “C” soils have moderately high runoff potential when thoroughly wet.

TABLE 3.9-2: SOILS HYDROLOGIC RATING

DESCRIPTION	*SOURCE MATERIAL*	*RATING*
Columbia fine sandy loam	Alluvium derived from igneous, metamorphic and sedimentary rock	C
Dello clay loam	Alluvium derived from granitic rock sources	C
Egbert silty clay loam	Alluvium derived from mixed rock sources	C
Merritt silty clay loam	Alluvium derived from mixed rock sources	C

SOURCE: NCRS 2024.

Development of the Project Area with impervious surfaces could reduce rainwater infiltration and groundwater recharge further. The collection of rainwater for those areas of impervious surfaces will be routed into the proposed Project’s storm drainage system. Stormwater would be gravity fed and eventually flow to the proposed retention basin. Once at the retention basis, water would percolate to underground groundwater stores.

As detailed in the City’s 2020 UWMP and mentioned previously in this section, the City’s groundwater wells are located in the Tracy Subbasin and the City is part of Tracy Subbasin GSA. The City was a part of the development of the GSP for the Tracy Subbasin in 2021. Based on the GSP for the Tracy Subbasin, and statements in the 2020 UWMP, the City’s groundwater supplies are expected to be highly reliable.

As discussed in Section 3.15, Utilities and Service Systems, of the City’s General Plan Draft EIR, the City’s 2020 UWMP documents current and projects future water demands and supplies through 2040. Water supplies to meet future demands include surface water purchased from SSJID, City produced groundwater and recycled water. The City’s water supply is projected to increase by about 54 percent from 2020 to 2040, primarily due to implementation of the City’s UMWP. Future City groundwater pumping is estimated based on the safe yield for all groundwater pumping within the City’s planning area which is not predicted to experience any additional restrictions as a result of the City’s GSP.

The City plans to utilize its existing groundwater wells to supply water in the future. As discussed in the City’s UWMP, the current estimated annual groundwater yield is 4,720 AFY and the City currently has no plans to install additional groundwater wells or expand its groundwater production. Additionally, as described in the UWMP the City's ability to utilize groundwater wells will not be impacted by groundwater levels within the Tracy groundwater basin, and would not require the City to limit groundwater production to maintain a sustainable groundwater budget. Based on the available information, it is anticipated that 100% the City's current estimated groundwater yield is available for the planning horizon.

Further, as noted in the GSP, each member City, including Lathrop, includes policies within the General Plan to further encourage water conservation and overall water system efficiency.

The proposed Project would not be required to build new municipal water wells to increase capacity of available water.

Much of the groundwater recharge in the basin occurs from irrigation followed by precipitation. Precipitation in the region is 12.2 inches, most of which falls between late October and early May. A portion of this annual rainfall infiltrates the soil and groundwater basin, while a portion is discharged downstream into irrigation canals and the San Joaquin River.

Much of the Project area would be maintained as pervious surface. The Project includes the following parks and open space areas which would largely be pervious:

- approximately 4.8 acres of linear park;
- approximately 6.2 acres of neighborhood park;
- approximately 2.0 acres of parkland dedication south of River Islands Parkway;
- approximately 2.1 acres of other open space (including landscaped entries);
- approximately 1.4 acres of levee slope easement; and
- approximately 38.2 acres of undeveloped land.

The residential lots would all have landscaped areas as well. The park, open space, and landscaped areas could maintain groundwater recharge areas. While the proposed Project would reduce the amount of pervious surfaces within the Project area, much of the site would be converted to impervious surface. This would result in opportunities for groundwater recharge after the Project area is fully developed.

For the reasons mentioned above, the proposed Project would not cause the substantial depletion of groundwater supplies or interfere substantially with groundwater recharge. As such, implementation of the proposed Project would have a ***less than significant*** impact relative to this topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.9-3: The proposed Project would not alter the existing drainage pattern of the site or area, including the alteration of the course of a river or through the addition of impervious surfaces, in a manner which would result in substantial erosion, siltation, surface runoff, flooding, or polluted runoff. (Less than Significant)

The Project site is comprised of flat land with ruderal grasses, fallow ground, several trees (located primarily along the northern and eastern boundary of the Project site), and a residence and associated structures. Currently, runoff from within the Project site is either maintained onsite, collected in a system of agricultural ditches and roadside ditches, or flows to the San Joaquin River. Public storm drain facilities are currently installed along River Islands Parkway. Planned urbanization of the Project site would result in changes to land use, natural vegetation, and infiltration characteristics, and would introduce new sources of water pollutants, producing "urban runoff." Pollutants contained within urban runoff may include, but are not limited to, sediment, oxygen-demanding substances (e.g., organic matter), nutrients (primarily nitrogen and phosphorus), heavy metals, bacteria, oil and grease, and toxic chemicals that can degrade receiving waters. Urban runoff pollutants may stem from erosion of disturbed areas, deposition of atmospheric particles derived from automobile or industrial sources, corrosion or decay of building materials, rainfall contact with toxic substances, decomposing plant materials, animal excrement, and spills of toxic materials on surfaces which receive rainfall and generate runoff. New residential uses within the Project site may also generate urban runoff from streets, driveways and parking areas. Yard areas may produce fertilizer wastes and/or bacterial contamination from animal excrement. New industrial development can generate urban runoff from parking areas, as well as any areas of hazardous materials storage exposed to rainfall.

According to the Mossdale Landing Master Drainage Plan, the Mossdale Village drainage shed is divided into six sub-sheds with a combined area of 912 acres. Each sub-shed functions independently and has its own pump station, storm water quality basin or vault and flood control detention basin. Underground detention solutions are permitted to be used where appropriate. Each sub-shed is required to treat the first flush storm event, which is the volume of water equal to the 85th percentile of a 24-hour storm event. The pumps will begin to discharge water to a single outfall at the San Joaquin River (up to 30 percent of the peak discharge rate) once the first flush event has been treated. After the rain event is over, the pumps will continue to direct water to the river; however, if the San Joaquin River rises to a base flood level of 21.0 feet, the pumps will shut off until the water level in the river subsides. More information can be obtained from the Drainage Plan.

The discharge of stormwater must be treated through BMPs prior to its discharge. The Lathrop Municipal Code provides rules and regulations to manage and control stormwater and discharge (Chapter 13.28). Section 13.28.120 requires compliance with all applicable NPDES permits. Additionally, Section 13.28.130 specifically provides requirement to prevent, control, and reduce stormwater pollutants. This includes requirements to implement BMPs to the extent they are technologically achievable to prevent and reduce pollutants. As noted previously, under this requirement, project proponents must sign an O&M agreement in which they legally bind themselves to maintain the installed post-construction design measures in an effective and good operational condition until the property ownership is transferred. A written O&M plan for the proposed stormwater design measures is required to be submitted to and approved by the city with the signed agreement. The agreement will be recorded with the deed by the county clerk making it transferrable to the new owner; or, when there are multiple property owners responsible for the maintenance of the control measures, the agreement will consist of a legally binding covenant between the city and the homeowners association or maintenance district. The owner or association responsible for the maintenance of the control measures may be required by the city to submit an annual self-certification that the stormwater control measures are effective and are being maintained in accordance with the submitted and approved O&M plan.

All stormwater would be pre-treated in accordance with current NPDES requirements, and would be retained on-site.

With the design and construction of the improvements included in the proposed storm drainage system, the proposed Project would have a ***less than significant*** impact relative to this topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.9-4 Implementation of the proposed Project would not risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones. (Less than Significant)

100-YEAR AND 500-YEAR FLOOD HAZARD ZONES

Flooding events can result in damage to structures, injury or loss of human and animal life, exposure of waterborne diseases, and damage to infrastructure. In addition, standing floodwater can destroy agricultural crops, undermine infrastructure and structural foundations, and contaminate groundwater.

As shown on Figure 3.9-2, the Development Area is not within the 100- or 500-year flood hazard zones. While portions of the Project site outside of the Development Area are located in the 100-year flood zone, these portions would be open space as part of the Project. Development of urban uses within the 100-year flood zone would not occur as a result of the Project. As noted previously, the Project site is within Zone X, Area with Reduced Risk Due to Levee. As such, impacts related to these FEMA flood hazard zones would be ***less than significant***.

SB 5 Flood Zones

As noted previously, both State policy and 2007 State legislation (Senate Bill 5) call for 200-year (0.5% annual chance) flood protection to be the minimum level of protection for urban and urbanizing areas in the Central Valley. SB 5 requires that the 200-year protection be consistent with criteria used or developed by the Department of Water Resources. SB 5 requires all urban and urbanizing areas in the Sacramento and San Joaquin Valleys to achieve 200-year flood protection in order to approve development.

To account for new requirements imposed by SB-5, San Joaquin County and the City of Lathrop have developed flood mapping that delineates 200-year flood extents. Based on SB-5 requirements, the City of Lathrop Public Safety Element incorporates goals, policies, and implementation measures related to 200-year flood risk and flood protection. The City has completed Zoning Code Amendments to reflect SB-5 requirements.

As shown in Figure 3.9-2, the majority of the Project site is located in the 200-year floodplain. However, pursuant to the City Municipal Code, the proposed Project would be required to comply with regulations contained in Chapter 17.17 (200-Year Flood Protection) of the City Municipal Code. Through compliance with these existing regulations, impacts would be ***less than significant***.

Tsunamis and Seiches

A tsunami is a sea wave caused by a submarine earthquake, landslide, or volcanic eruption. A tsunami can cause catastrophic damage to shallow or exposed shorelines. The Project Area is approximately 63 miles from San Francisco Bay and 83 miles from the coast, which is sufficiently distant to preclude effects from a tsunami.

Seiches are changes or oscillations of water levels within a confined water body. Seiches are caused by fluctuation in the atmosphere, tidal currents or earthquakes. The effect of this phenomenon is a standing wave that would occur when influenced by external causes. The Project Area is not adjacent to any lakes that pose a significant risk from a seiche event.

Dam Inundation

The Development Area is located within the dam failure inundation area for the Don Pedro Dam. Additionally, a portion of the Project site, outside the Development Area, is within the dam failure inundation area for the Vermilion Valley Dam, Cherry Valley Dam, Huntington Lake 1 Dam, Mammoth Pool Dam, O' Shaughnessy Dam, and Shaver Lake Dam. Figure 3.9-3 shows areas that are susceptible to dam inundation. Dam failure is generally a result of structural instability caused by improper design or construction, instability resulting from seismic shaking, or overtopping and erosion of the dam. As discussed previously, larger dams that are higher than 25 feet or with storage capacities over 50 AF of water are regulated by the California Dam Safety Act, which is implemented by the California Department of Water Resources, DSD. The DSD is responsible for inspecting and monitoring these dams. The Act also requires that dam owners submit to the California Office of Emergency Services inundation maps for dams that would cause significant loss of life or personal injury as a result of dam failure. The County Office of Emergency Services is responsible for developing and implementing a Dam Failure Plan that designates evacuation plans, the direction of floodwaters, and provides emergency information.

Regular inspection by DSD and maintenance by the dam owners ensure that the dams are kept in safe operating condition. As such, failure of these dams is considered to have an extremely low probability of occurring and is not considered to be a reasonably foreseeable event.

While the Development Area is located within the dam failure inundation area for the Don Pedro Dam, the proposed Project is not anticipated to result in the exposure of people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, seiche, tsunami, or mudflow. The potential for dam failure is extremely low. Furthermore, the implementation of the proposed project does not exacerbate existing environmental hazards or, in other words, increase the likelihood of dam failure. Therefore, implementation of the proposed Project would have a ***less than significant*** impact relative to this topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.9-5: The proposed Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. (Less than Significant)

WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO-SAN JOAQUIN RIVER BASINS

The Water Quality Control Plan for the Sacramento-San Joaquin River Basins is the guiding documents for water quality in the City of Lathrop. This document includes a summary of beneficial water uses, water quality objectives needed to protect the identified beneficial uses, and implementation measures. The preparation and adoption of water quality control plans (Basin Plans) is required by the California Water Code (Section 13240) and supported by the Federal Clean Water Act. Section 303 of the Clean Water Act requires states to adopt water quality standards which "consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses." The Basin Plan establishes water quality standards for all the ground and surface waters of the region. The term “water quality standards,” as used in the Federal Clean Water Act, includes both the beneficial uses of specific water bodies and the levels of quality that must be met and maintained to protect those uses. The Basin Plan includes an implementation plan describing the actions by the RWQCB and others that are necessary to achieve and maintain the water quality standards.

The overall design of the drainage infrastructure will be required to comply with the *Multi-Agency Post-Construction Stormwater Standards Manual* (2015), which ensures development projects comply with the NPDES permit requirements, facilitates review of applications, and promotes integrated Low Impact Development (LID) design. The Manual also ensures proposed storm drains and infiltration/detention system have been designed to convey the required flow rates and will comply with the flood protection and storm water quality requirements of the City of Lathrop and San Joaquin County.

As discussed in Impacts 3.9-1, impacts related to water quality during construction and operation would be less than significant. The Project applicant would be required to prepare a SWPPP which would ensure that stormwater runoff does not adversely increase pollutant levels. Additionally, the Project would be required to implement a SWWP and comply with all requirements of the City's Stormwater Management and Discharge Control ordinance (Chapter 13.28 of the Code) and the City's SWMP. The SWMP was adopted to comply with requirements of the Phase 2 NPDES municipal stormwater permit and requires BMPs and O&M practices, among other requirements. The purpose of Chapter 13.28 of the Code is to establish minimum stormwater management requirements and controls to protect and safeguard the general health, safety, and welfare of the public residing in watersheds within the city of Lathrop, pursuant to and consistent with the Federal Clean Water Act (33 U.S.C. Section 1251 et seq.) and the Porter-Cologne Water Quality Act (California Water Code Section 13000 et seq.). Section 13.28.130 of the Code regulates stormwater and also requires BMPs for operation.

GROUNDWATER SUSTAINABILITY PLAN

As mentioned above, the City is located within the Tracy Subbasin and the entire Subbasin is covered by the Tracy Subbasin GSP (adopted by the City of Lathrop GSA in December 2021). Six agencies filed with DWR to become GSAs to cover the entire Subbasin. DWR designated them as exclusive in 2016 and 2017. In 2018, the Subbasin boundaries were modified which resulted in the formation of the East Contra Costa Subbasin and inclusion of the City of Lathrop areas into the Tracy Subbasin. The six GSAs in the Subbasin are: Banta-Carbona Irrigation District; Byron-Bethany Irrigation District; City of Lathrop; City of Tracy; County of San Joaquin; and Stewart Tract.

As discussed in Impact 3.9-2, the Project would not decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin. As discussed in Impact 3.14-42 in Section 3.14, the 2020 UWMP accounts for a portion of projected future development within the Project site in its analysis, but does not include the entire proposed Project. According to the 2020 UWMP, 658 low-density dwelling units were previously planned for within the Project site.[1] Using the 330 gpd/du for low-density uses, the water demand of 243 AFY that is associated with those 658 dwelling units was already accounted for in the water supply planning within the 2020 UWMP. When the 243 AFY of demand is removed from the 378 AFY total projected water demand for the Project, the Project would have an incremental water demand of 135 AFY that was not previously accounted for in the 2020 UWMP.

[1] EKI Environment & Water, Inc., 2020 Urban Water Management Plan for City of Lathrop. June 2021. Page 22.

It is noted that the Specific Plan provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units / acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the water demand projection is conservative as the number of units constructed at buildout would likely be closer to 829, as shown on the Vesting Tentative Subdivision Map.

The technical analyses shows that the total projected water supplies determined to be available for the proposed Project during normal, single dry, and multiple dry years through 2040 will meet the projected water demand associated with the proposed Project, in addition to existing and planned future uses. However, supply shortfalls of three percent (450 AF) are projected to occur in 2045 for single dry years and the third and fourth years of a multiple dry year period. It should be noted that similar to Project conditions, under existing conditions (i.e., without Project implementation), the 2020 UWMP projects that the City will experience supply shortfalls (314 AF or two percent) in 2045 during single dry years and third and fourth years of a multiple dry year period.

The City's existing near-term and long-term reliable supplies of surface water supplies and groundwater supplies can deliver a sustainable reliable water supply to meet existing and foreseeable water demands without impacting environmental values and/or impacting the current stabilization of the groundwater basin.

CONCLUSION

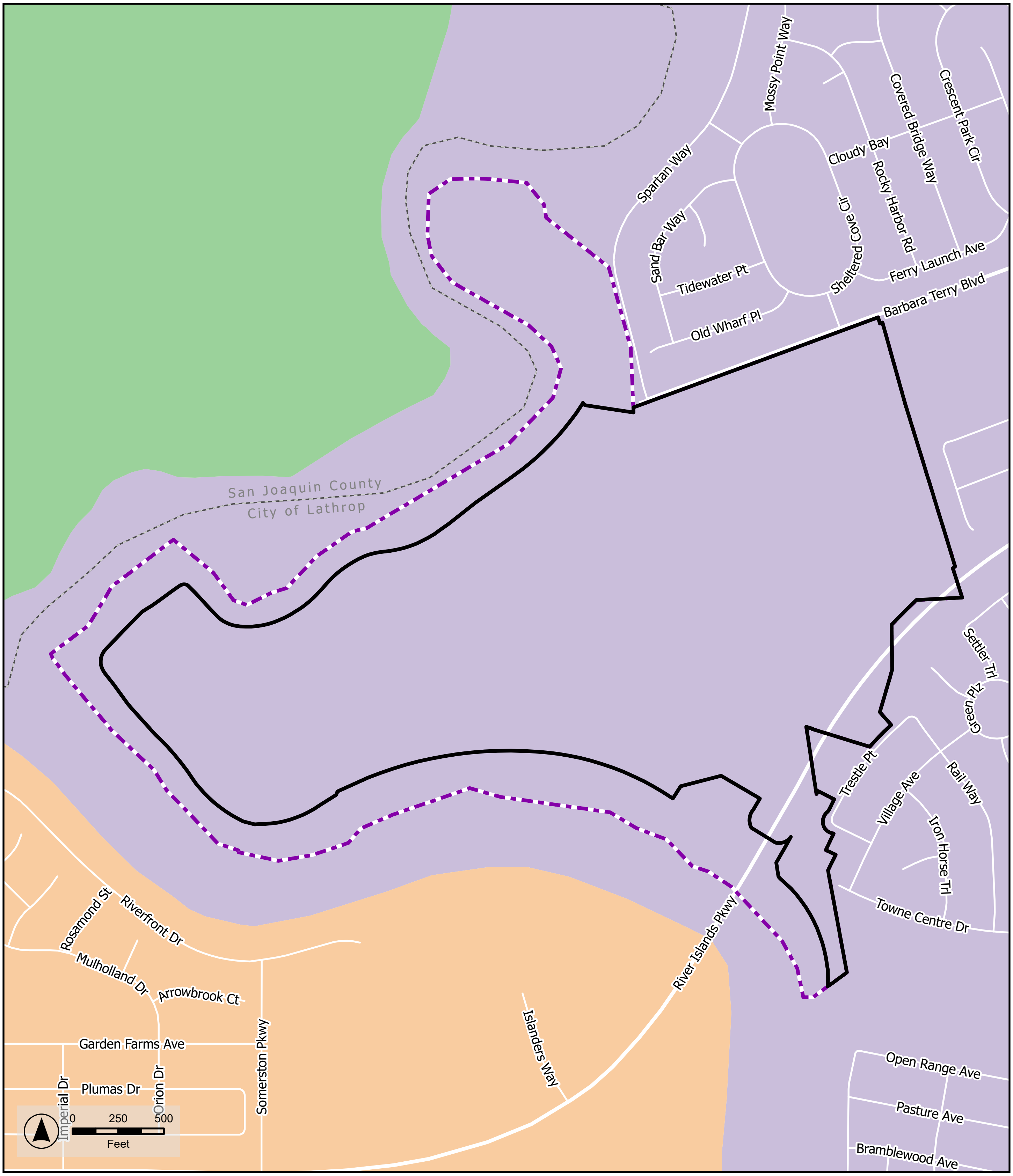
Overall, implementation of the proposed Project would not conflict with the Basin Plan or the IRGMP. Implementation of the proposed Project would have a ***less than significant*** impact relative to this topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.



Legend

Project Boundary/Development Area (167.42 acres)

Mossdale West Project Area (225.86 acres)

Fivemile Creek-San Joaquin River

Lone Tree Creek-San Joaquin River

Old River

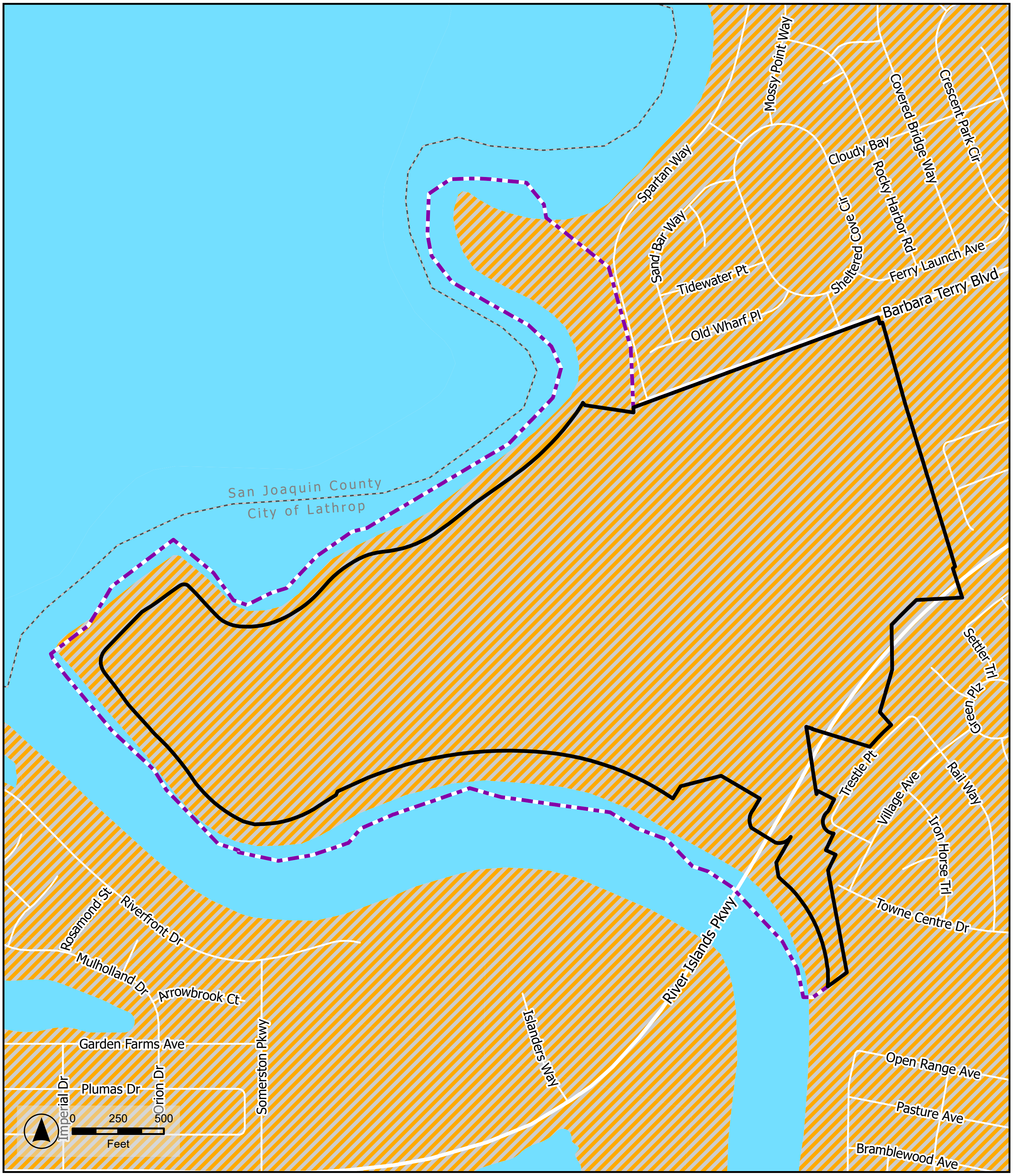
LATHROP MOSSDALE WEST

Figure 3.9-1. Watersheds

Sources: NHD; San Joaquin County GIS. Map date: May 2, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page intentionally left blank.



Legend

Project Boundary/Development Area (167.42 acres)

Mossdale West Project Area (225.86 acres)

100-Year Flood Zone

Area with Reduced Flood Risk due to Levee

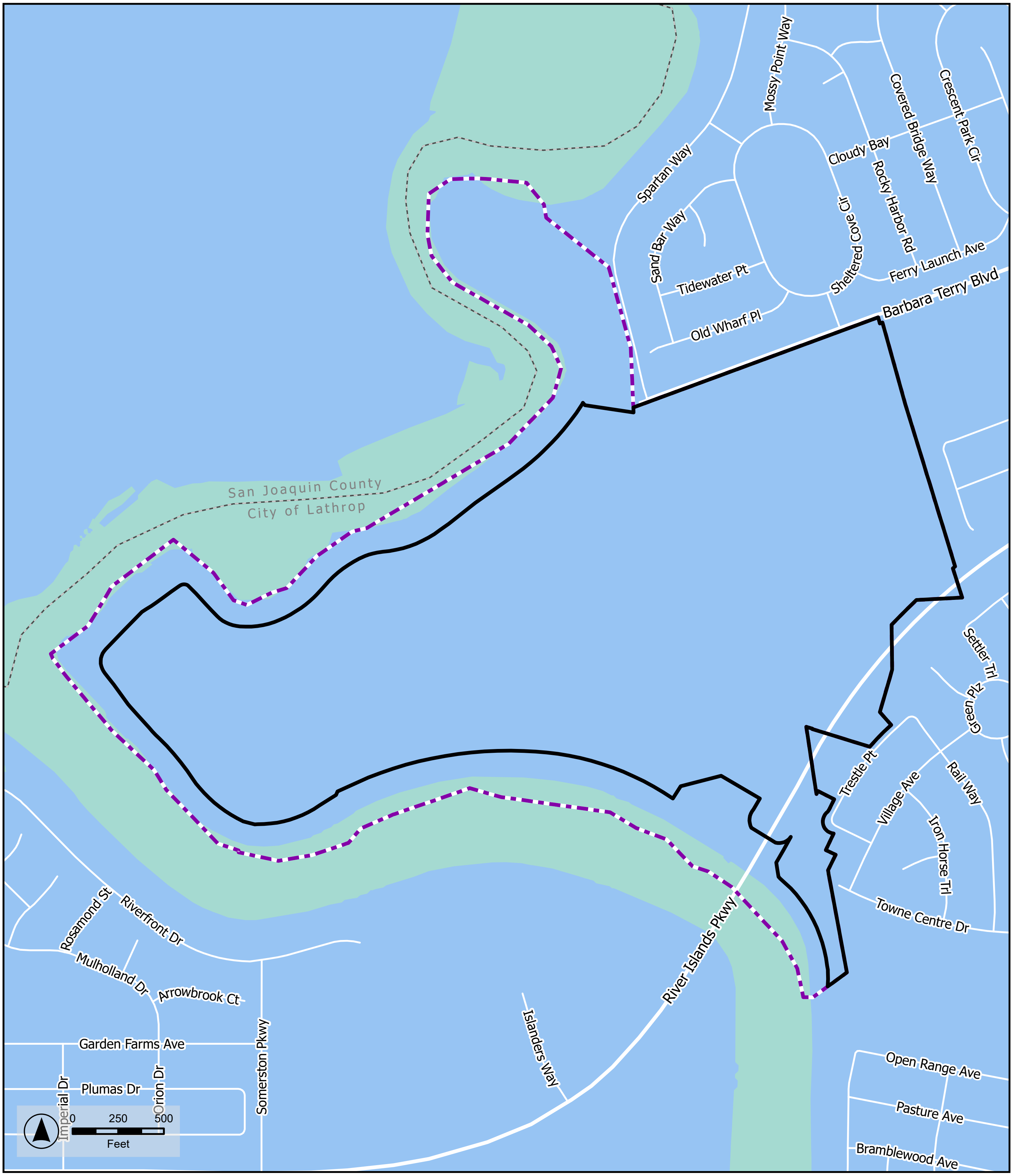
LATHROP MOSSDALE WEST

Figure 3.9-2. FEMA Flooding Areas

Sources: FEMA; San Joaquin County GIS. Map date: May 2, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page intentionally left blank.



Legend

Project Boundary/Development Area (167.42 acres)

Mossdale West Project Area (225.86 acres)

Dam Name

Don Pedro

Vermilion Valley; Cherry Valley; Huntington Lake 1; Mammoth Pool; O' Shaughnessy; Shaver Lake

LATHROP MOSSDALE WEST

Figure 3.9-3. Dam Inundation Areas

Sources: DWR; San Joaquin County GIS. Map date: May 2, 2024.

This page intentionally left blank.

This section describes the existing land uses in the Project site and in the surrounding area, describes the applicable land use regulations, and evaluates the environmental effects of implementation of the proposed Project related to land use, population, and housing. Information in this section is based on information provided in the Project materials, and the following reference documents: *City of Lathrop General Plan (City of Lathrop, 2022), the City of Lathrop Draft Environmental Impact Report for the General Plan Update (City of Lathrop, 2022), the City of Lathrop Municipal Code, Title 17 Zoning (City of Lathrop, 2022), Municipal Service Review (City of Lathrop, 2022), and the San Joaquin County General Plan (County of San Joaquin, 2025).*

One comment was received during the Notice of Preparation (NOP) scoping process related to this environmental topic from the San Joaquin Council of Governments, Inc. (March 27, 2024). Full comments received during the NOP process are included within Appendix A.

3.10.1 ENVIRONMENTAL SETTING

EXISTING PHYSICAL ENVIRONMENT

Specific Plan Area

The Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site) is located within the West Lathrop Specific Plan (WLSP) area in the City of Lathrop, San Joaquin County, California (Figures 2.0-1 and 2.0-2). The site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south.

The Specific Plan Area is comprised of the following APNs (Figure 2.0-3):

- 191-190-74;
- 191-190-75;
- 191-190-76;
- 191-190-77;
- 191-190-78;
- 191-340-03;
- 191-610-02;
- 191-610-22;
- 191-620-50; and
- 191-620-59.

The majority of the Plan Area is currently undeveloped (Figure 2.0-4). There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

Surrounding Land Uses

Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

DEMOGRAPHICS

Population and Households

Table 3.10-1 summarizes the population and household data for Lathrop and San Joaquin County from 1990 through 2020.

TABLE 3.10-1: POPULATION AND HOUSEHOLD GROWTH

	1990	*2000*	*2010*	*2020*	*1990-2000 % CHANGE*	*2000-2010 % CHANGE*	*2010-2020 % CHANGE*
LATHROP							
Population	6,841	10,445	18,023	26,503	53%	72%	48%
Households	1,927	2,908	4,782	5,503	51%	64%	15%
Persons per household	3.55	3.59	3.77	3.88	1%	5%	3%
SAN JOAQUIN COUNTY							
Population	480,628	563,598	685,306	773,505	17%	22%	13%
Households	166,274	181,629	215,007	228,567	9%	18%	6%
Persons per household	2.94	3.00	3.12	3.22	2%	4%	3%

SOURCE: U.S. CENSUS, 1990, 2010; LATHROP HOUSING ELEMENT, 2016; CALIFORNIA DEPARTMENT OF FINANCE, 2021.

Lathrop incorporated in 1989 and by 1990, the US Census Bureau recorded the population at 6,841. From 1990 to 2000, the city's population increased by 51% from 6,841 to 10,445 persons. From 2000 to 2010 Lathrop experienced population growth increasing by approximately 72% from 10,445 to 18,023. San Joaquin County's total population increased by approximately 20% during the decades of 1990-2000 and 2000-2010. As of 2020, Lathrop's population was estimated to be 26,806, an increase of 49% from the 2010 population of 18,023. As of 2024, the California Department of Finance estimated Lathrop's population to be 37,033.

Over the years, the average household size has fluctuated slightly with a high of 3.88 in 2020 and a low of 3.55 in 1990.

Housing Units

As shown in Table 3.10-2, the number of housing units in Lathrop has increased at rates similar to the population with significant increases since 1990. In 2020, there were 7,284 housing units in the city. From 2000 to 2010, housing units increased from 2,991 to 5,261, a 76% increase, while between 2010 and 2020 the city experienced a 38% increase.

TABLE 3.10-2: HOUSING UNITS

	1990	2000	2010	2020	1990-2000 % CHANGE	2000-2010 % CHANGE	2010-2020 % CHANGE
Lathrop	2,040	2,991	5,261	7,284	47%	76%	38%
San Joaquin County	158,659	189,160	233,755	249,058	19%	24%	6.6%

SOURCE: U.S. CENSUS, 2000, 2010; LATHROP HOUSING ELEMENT, 2016, 2010 CALIFORNIA DEPARTMENT OF FINANCE, 2020.

3.10.2 REGULATORY SETTING

STATE

California Planning and Zoning Law Government Code Section 65300

California Government Code Section 65300 et seq. establishes the obligation of cities and counties to adopt and implement General Plans. The General Plan is a comprehensive, long-term, and general document that describes plans for the physical development of a jurisdiction and of any land outside its boundaries that, in the jurisdiction's judgment, bears relation to its planning. The General Plan addresses a broad range of topics, including, at a minimum, land use, circulation, housing, conservation, open space, noise, and safety. In addressing these topics, the General Plan identifies the goals, objectives, policies, principles, standards, and plan proposals that support the jurisdiction's vision for the area. The General Plan is a long-range document that typically addresses the physical character of an area over a substantial time period, such as 20 years. Although the General Plan serves as a blueprint for future development and identifies the overall vision for the planning area, it remains general enough to allow for flexibility in the approach taken to achieve the plan's goals.

A Specific Plan is another planning device that governs a smaller land area than the General Plan, but must be consistent with the overarching General Plan. Specifically, a Specific Plan implements the general plan in a particular geographic area. (Government Code Section 65450.) More generally, a Specific Plan describes the distribution, location, and extent of the land uses and the associated infrastructure, as well as standards governing future development. The specific plan must include a statement of the relationship between it and the general plan. (Government Code Section 65451, subd. [c].) A local jurisdiction's conclusion that a specific plan is consistent with its general plan "carries a strong presumption of regularity." (*Napa Citizens for Honest Government v. County of Napa Bd. of Supervisors* (2001) 91 Cal.App.4th 342, 357.)

Chapter 4 of the State Planning and Zoning Law, entitled Zoning Regulations (California Government Code Section 65800 et seq.), establishes that, in general law cities such as Lathrop (as opposed to charter cities), zoning ordinances, which are laws that define allowable land uses within a specific district, are required to be consistent with the General Plan and any applicable specific plans. When amendments to the General Plan are made, corresponding changes in the zoning ordinance may be required within a reasonable time to ensure the land uses designated in the General Plan would also be allowable by the zoning ordinance (Government Code Section 65860, subd. [c]).

Senate Bill 330: The Housing Crisis Act of 2019

The Housing Crisis Act (SB 330) is intended to eliminate some of the most common entitlement impediments to the creation of new housing, including delays in the local permitting process and cities enacting new requirements after an application is complete and undergoing local review. Its provisions expire, however, on January 1, 2025. The discussion below focuses on how the legislation affects housing development projects proposed to cities, as opposed to counties.

As applied to cities, SB 330 does all of the following:

- Requires that cities complete their review and approval processes for housing development within certain time periods;
- Restricts cities from applying new standards, policies, and laws to a development after a project sponsor submits a complete preliminary application;
- Restricts cities from enacting policies, standards or conditions, such as housing moratoria, that would limit housing development;
- Freezes the ability of cities to downzone property planned or zoned for housing; and
- Prevents cities from changing the residential general plan, specific plan, and zoning designation to "a less intensive use" or to reduce the intensity of the designation below what was allowed on January 1, 2018, except where the city "concurrently changes the development standards, policies, and conditions applicable to other parcels within the jurisdiction to ensure that there is no net loss in residential capacity."

Under SB 330, cities are prohibited from conducting more than five hearings in connection with a housing project approval if the project complies with the applicable objective general plan and zoning standards in effect at the time an application is deemed complete.

SB 330 also reduces the amount of time that a city has to approve or disapprove an application under the Permit Streamlining Act from 120 to 90 days for a housing project that requires CEQA review, and from 90 to 60 days if a housing project is proposing at least 49% affordable units.

Additionally, cities are prohibited from disapproving housing development projects for very low, low-, or moderate-income households unless they make certain written findings. Under modifications to a statute that predated SB 330 (Government Code Section 65589.5, subd. [j]), cities are also prohibited from either disapproving a housing project or imposing condition of approval that lower the density for a housing project that complies with the applicable objective general plan, zoning, and subdivision standards in effect at the time that the application was deemed complete. An exception exists where the city can find that the housing project would have a specific, adverse impact upon the public health or safety unless the project is disapproved or approved upon the condition that the project be developed at a lower density. In this context, a "specific, adverse impact" means a significant, quantifiable, direct, and unavoidable impact, based on objective, identified written public health or safety standards, policies, or conditions as they existed on the date the application was deemed complete.

If a proposed housing project is not consistent with or in compliance with local standards, cities must provide the applicants with written documentation identifying and explaining why the proposed project is not in compliance within specified timeframes. SB 330 also clarifies that a project's use of the State Density Bonus Law shall not constitute a valid basis on which to find that a proposed housing project is inconsistent, not in compliance, or not in conformity with objective standards.

Under SB 330, once a project sponsor submits a preliminary application containing all of the required information, a city is prohibited from applying new ordinances, policies, and standards to a proposed housing project, subject to certain exceptions.

Additionally, SB 330 allows a project applicant, a person who would be eligible to apply for residency in the proposed project, or a housing organization to file a lawsuit if a city requires a housing project to comply with a new ordinance, policy, or standard that was not adopted and in effect when a preliminary application was submitted.

With respect to land where housing is an allowable use, cities are prohibited from enacting changes that would have the following effects:

- Reducing the intensity of land use to levels below what was permitted by the city as of January 1, 2018 by changing the general plan land use designation, specific plan land use designation, or zoning of a parcel;
- Imposing a moratorium or similar restriction or limitation on housing development, unless the California Department of Housing and Community Development (HCD) approves it;
- Imposing or enforcing new design review standards established after January 1, 2020, if the standards are not objective;
- Capping the number of housing units that can be approved or constructed either annually or for some other period of time (unless the limit was approved by voters prior to January 1, 2005 and the city is located in a predominantly agricultural county); and
- Limiting the population of the city or county.

SB 330 places additional requirements on projects that involve the demolition of existing residential units. SB 330 requires that cities may only approve housing developments that include the demolition of residential units if the project will create at least as many residential dwelling units as will be demolished.

For projects involving the demolition of protected units, cities may only give their approval if the projects meet the following criteria:

- The project will replace all existing or demolished protected units (which would count towards meeting inclusionary housing requirements);

- The project will include at least as many residential dwelling units as the greatest number of residential dwelling units that existed on the project site within the last five years;
- Existing residents, if any, are allowed to occupy their units until six months before the start of construction; and
- The developer agrees to provide to the affordable housing rental unit occupants relocation benefits and a right of first refusal for units available in the new housing development at an affordable rent for the household.

LOCAL

City of Lathrop General Plan

General Plans are prepared under a mandate from the State of California, which requires each city and county to prepare and adopt a comprehensive, long-term general plan for its jurisdiction and any adjacent related lands. State law requires General Plans to address seven mandated components: circulation, conservation, housing, land use, noise, open space, and safety. In addition to those components required by State law, the Lathrop General Plan also contains optional Economic Development, Public Facilities, and Environmental Justice Elements

The General Plan functions as a "constitution" for the City of Lathrop and reflects the long-range aspirations of physical form and amenity and provides guidance to the substance of developmental regulations and other programs of the City Council. The Lathrop General Plan is comprehensive, long-range and general. The Plan Area is designated as Low Density Residential (LD) by the City's General Plan Land Use Map. In the LD land use category, low density Residential development will typically involve single-family detached housing on individual lots although developments at the higher range of the allowed development densities may accommodate clustered developments as part of a Planned Development.

General Plan Land Use Map: The Lathrop General Plan Land Use Map portrays the ultimate uses of land in the City of Lathrop through land use designations.

City of Lathrop General Plan Policies: General Plan policies applicable to land use are summarized below. General Plan policies associated with specific environmental topics (aesthetics, air quality, agriculture, biological resources, cultural resources, geology/soils, hazards, hydrology/water quality, noise, public services/recreation, transportation, utilities, etc.) are discussed in the relevant chapters of this EIR.

3.10.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed Project will have a significant impact on land use, population, or housing if it will:

- Physically divide an established community;

- Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect;
- Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);
- Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

IMPACTS AND MITIGATION MEASURES

Impact 3.10-1: The proposed Project would not physically divide an established community, or displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. (Less than Significant)

The Project site is located in the City of Lathrop and is adjacent to residential land uses to the east. The Project site would result in an extension of developed uses within an area of the city that currently has approved development plans within the vicinity of the Project site. The Project would provide roadways and pedestrian pathways to connect the Project site to the existing circulation system and to allow access to and from the site. Development of the Project site would not result in physical barriers, such as a highway, wall, or other division, that would divide an existing community, but would serve as an orderly extension of existing and planned development.

There is one residential structures located on the Project site. Development of the Project would remove this housing unit and add up to 912 residential units. Therefore, the Project would not displace substantial numbers of people or existing housing.

Overall, the Project will have a ***less than significant*** impact related to division of an established community and the displacement of substantial numbers of people or existing housing.

Impact 3.10-2: The proposed Project would not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project adopted to avoid or mitigate an environmental effect. (Less than Significant)

The Specific Plan builds upon the policy framework and direction set forth for development in Lathrop by the City's General Plan. This translates into a focused, detailed, comprehensive plan for the Specific Plan Area that addresses land use, the characteristics of development, circulation, parking, infrastructure, and community development.

LATHROP GENERAL PLAN

The land uses as proposed are not consistent with the General Plan. When land uses are not consistent with a General Plan there are two courses of action: 1) the uses are not allowed due to the inconsistency, or 2) the land uses are changed through an amendment to the General Plan to create consistency. The proposed Project will include a General Plan Amendment from LD to LD, Park (P), and Open Space (O). Approval of the General Plan amendment would ensure that the proposed Project would be substantially consistent with the Lathrop General Plan land use requirements.

Additionally, the Project is consistent with most of the applicable General Plan policies that aim to avoid or mitigate an environmental effect. As shown in Table 3.10-3, the Project is consistent with many of the City's General Plan policies.

TABLE 3.10-3: GENERAL PLAN POLICY CONSISTENCY

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
LAND USE	
LU-1.1 Support a full spectrum of conveniently located residential, commercial, industrial, public, and quasi-public uses that support business development, regional transportation objectives and the livability of residential neighborhoods.	**Consistent.** The Project includes the development of residential uses and public uses which would support livability of residential neighborhoods within the City of Lathrop by providing park and residential uses in an area of the City designated for residential uses.
LU-1.9 Promote equitable land use patterns to ensure that all residents in neighborhoods have access to community amenities and transportation choices, and have safe places to walk and bike.	**Consistent.** The Project provides public amenities which would benefit all residents in the Project vicinity, as well as future Project residents. The Specific Plan will include bicycle, pedestrian, and transit facilities to increase access to transportation choices and increase safety for walking and biking. Pedestrian walkways would be provided along all local streets. Class II bike lanes will be provided along the proposed arterial and collector streets. A multi-use trail with a Class I bike path would be provided along the San Joaquin River. Additionally, two bus stops are proposed along Street W. Further, the Project would include community amenities, such as linear park, neighborhood park, and open space.
LU-3.1 Support regional efforts that promote higher densities and intensities near major transit and travel facilities, and reduce regional vehicle miles traveled by supporting active modes of transportation including walking, biking, and public transit.	**Consistent.** The Project site is designated for LD uses in the City's General Plan and the Project would provide LD, P, and O uses. While the Project does not include higher density uses, the Project site is also not located near major transit facilities. The Project site is located in an area of the City which contains existing low density residential uses. Further, as noted above, the Project includes facilities for active modes of transportation, including walking, biking, and public transit.
LU-4.2 Emphasize efforts to reduce	**Consistent.** Impacts associated with VMT are discussed in

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
regional vehicle miles traveled (VMT) by supporting land use patterns and site designs that promote active modes of transportation, and public transit.	Impact 3.13-2 in Section 3.13. As described in Section 3.13, Transportation and Circulation, without incorporating proposed features which would reduce VMT, the Project's VMT per capita value of 16.29 is higher than the citywide threshold of 15.44. However, the proposed Project design reflects many features that help reduce VMT. To ensure the Project would result in a VMT per capita which is below threshold, a decrease of 6.14 percent (or 1.01 VMT per capita) would be required for the Project. The proposed Project design features would reduce VMT for the Project a total of 7.4 percent. With the proposed Project design features, the Project's VMT per capita would be more than 15 percent below the Citywide average for the total home-based residential VMT per capita statistic; therefore, impacts related to VMT would be less than significant.
LU-5.1 Require new development to be compatible and complementary to existing development. Where appropriate and feasible, promote connections between neighborhoods and services and facilities.	**Consistent.** The Project is a new development which is compatible with surrounding and adjacent buildings and public spaces. The existing land adjacent to the Project site includes mainly residential uses. The proposed residential and public uses would be constructed in a similar form and scale as the existing residential uses within the City of Lathrop.
LU-5.6 In considering land use change requests, consider factors such as compatibility with surrounding uses in terms of privacy, noise, and changes in traffic levels.	**Consistent:** The Plan Area is designated as LD by the City's General Plan Land Use Map. The proposed Project will include a General Plan Amendment from LD to LD, P, and O. The Project site is located in an area of the City with similar surrounding land uses as the proposed Project.
LU-7.1 Encourage San Joaquin County to retain existing agricultural land use designations in areas outside of the Lathrop SOI.	**Does Not Conflict:** The Project site is located within the Lathrop SOI and City limits.
LU-7.2 Support the continuation of agricultural operations and activities on lands adjacent to the SOI and within the City's Area of Influence.	**Does Not Conflict:** The Project site is located within the Lathrop City limits. As discussed in Section 3.2, Agricultural Resources, while Prime Farmland which contains agricultural uses is located north of the Plan Area, the Project includes a buffer along the San Joaquin River. The proposed Project also includes adequate measures to buffer project uses from adjacent agricultural uses and would reduce adverse effects on neighboring agricultural uses, while supporting ongoing agricultural operations in areas within and surrounding the proposed Project.
LU-7.3 Allow and support the continuation of agricultural operations on lands within the City limits which are designed for urban uses until such time as urban development is proposed for the	**Consistent:** The Project site is located within the City limits. As noted above, while Prime Farmland which contains agricultural uses is located north of the Plan Area, the Project includes a buffer along the San Joaquin River. The proposed Project provides an open space

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
land.	buffer between the Project site and existing agricultural operations located to the north and northwest. It is noted, however, that the agricultural operations to the north and northwest are not within the City limits. Nevertheless, the Project site is buffered from agricultural operations in order to buffer project uses from adjacent agricultural uses and would reduce adverse effects on neighboring agricultural uses.
CIRCULATION	
CIR-1.2 Complete Streets. Consider all modes of travel in planning, design, and construction of all transportation projects to create safer, more livable, and more inviting environments for pedestrians, bicyclists, motorists and public transit users of all ages and capabilities.	**Consistent:** The Project provides facilities and amenities which serve all modes of transportation. As discussed previously, the Specific Plan will include bicycle, pedestrian, and transit facilities to increase access to transportation choices and increase safety for walking and biking. Pedestrian walkways would be provided along all local streets. Class II bike lanes will be provided along the proposed arterial and collector streets. A multi-use trail with a Class I bike path would be provided along the San Joaquin River. Additionally, two bus stops are proposed along Street W.
CIR-2.2 Safety. Improve safety conditions, efficiency, and comfort for bicyclists and pedestrians by providing shade trees and controlling traffic speeds by implementing narrow lanes or other traffic calming measures.	**Consistent:** As discussed above, the Specific Plan will include bicycle and pedestrian facilities in order to improve safety for bicyclists and pedestrians. Additionally, trees would be provided throughout the site, including proposed roadways, along sidewalks, and within the proposed park areas. Further, traffic calming measures such as enhanced paving and/or colored paving at crosswalks and landscape parkway strips separating vehicle traffic from the pedestrian sidewalk may be used to help reduce traffic speeds at the intersection. All intersections and street sections would be reviewed by the City of Lathrop and designed to comply with typical City standards.
CIR-2.4 Transit Access. Provide safer, more convenient access to transit service including rail, bus, and paratransit.	**Consistent:** As discussed in Section 3.13, existing bus routes do not pass directly by the Specific Plan Area. The Project site is within a 1.5 mile of two San Joaquin RTD bus stops, located on the northwest corner of E Louise Avenue/Harlan Road Intersection. It is noted, however, that new transit service is desired within the Specific Plan Area, and turnouts and bus stops will be provided to accommodate transit in coordination with the transit providers. As discussed previously, two bus stops are proposed along Street W. As such, development of the Plan Area would increase opportunities for bus usage for the existing and proposed residents.
CIR-2.5 Amenities. To support bicycle, pedestrian, and transit usage, provide amenities including pedestrian-scale lighting, bicycle parking, shade trees and	**Consistent:** The Project provides pedestrian-scale lighting, bicycle parking, shade trees and landscaping, and bus stops.

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
landscaping, and bus shelters and benches.	
CIR-4.1 Land Use Supporting Reduced VMT. Support land use with increased land use densities and mixed uses, consistent with the Land Use Element, to reduce vehicle miles traveled and promote the use of walking, biking, and transit.	**Does Not Conflict:** As described previously, the proposed Project design reflects many features that help reduce VMT. These features include pedestrian walkways, Class II bike lanes, multi-use trails, and bus stops.
RECREATION AND RESOURCES	
RR-2.1: Open Space Boundaries. Maintain existing open space lands within the city by carefully considering the impact of new development in established open space areas.	**Does Not Conflict:** The Project site is not designated as Open Space by the City of Lathrop. The proposed Project would result in land uses that are generally consistent with the land use designation of the Project site. More specifically, the Project proposes the construction of residential, park and open space uses. As shown in Figure 2.0-10, the area along the San Joaquin River would be designated for open space uses.
RR-2.3 Scenic Resources. Protect the city's scenic resources, including scenic corridors along roads and views of the hillsides, waterways, and other significant natural features, to the extent practical.	**Does Not Conflict:** There are no County designated scenic corridors, trails, or rivers located in the Project site. Additionally, there are no "eligible" highway segments in the Project vicinity that may be included in the State Scenic Highway system. As noted above, the area along the San Joaquin River would be designated for open space uses. Members of the public would be able to access this open space area.
RR-3.1: Preservation. Protect areas containing significant historic, archaeological, and paleontological resources, as defined by the California Public Resources Code.	**Does Not Conflict:** As discussed in Section 3.5, Cultural and Tribal Resources, according to the records search results, no cultural resources have been reported within the Project site; however, several resources have been found within the vicinity of the Project site. Three prehistoric period artifacts were found in the vicinity of the Plan Area. Two isolated prehistoric period artifacts (P-39-004345 and P-39-004347), and one isolated historic period glass fragment (P-39-004346). The southern portion of the Project site lies at the location of "Johnson's Ferry." There is clearly a higher point in the Project site that could have been a prehistoric period site. Although no historic site was found by former surveys, it is possible that historic period activities, including residential construction, may have covered the remnants of a prehistoric site. Water crossings throughout northern and central California are historically located on high spots, allowing a safe crossing for ferries and bridges. These high spots have proven to be the locations of prehistoric sites, at one or both ends of the bridge or ferry landings. In the Plan Area, there is a higher elevation that

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
	could be a prehistoric period site. There are no records of any findings when the bridge was installed for River Island Parkway and no prehistoric period resources were found within the boundaries of the Plan Area. However, there is potential that a site could exist and it is unknown. The findings of the Cultural Resources Assessment concluded the Project site possesses a possibility to contain previously unrecorded historic era cultural resources that are currently obscured by existing vegetation, fill, or other historic activities, leaving no surface evidence. Section 3.5 includes mitigation measures to reduce any potentially significant impacts to a less-than-significant level.
RR-3.3: Human Remains. Ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.	**Consistent:** No human remains are documented on or near the Project site. Compliance with the existing regulatory environment would ensure that all construction activities which inadvertently discover human remains implement State-required consultation methods to determine the disposition and historical significance of any discovered human remains, which would ensure impacts are less than significant.
RR-3.4: Tribal Consultation. Consult with Native American tribes that may be impacted by proposed development, as necessary, and in accordance with state, local, and tribal intergovernmental consultation requirements.	**Consistent:** Peak & Associates contacted the NAHC for a check of the Sacred Lands files for the Project site. On October 12, 2022, the NAHC provided a reply with positive results from the Sacred Lands files search. Pursuant to both Assembly Bill (AB) 52 and Senate Bill (SB) 18, the City of Lathrop sent letters to the groups and individuals listed on December 13, 2023. All correspondence related to the consultation effort are presented in Appendix C.2.
RR-4.1:Sensitive Communities. Protect, conserve, and enhance Lathrop's biological resources, with a special focus on sensitive, rare, or endangered plant and wildlife species in accordance with state and federal resource agency requirements.	**Consistent:** This EIR includes an in-depth analysis of impacts related to biological resources, including the potential for impacts to sensitive, rare or endangered plants and wildlife, as well as habitat. Where impacts are identified, mitigation measures are presented to minimize, avoid, or compensate to the extent practicable. See Section 3.4, Biological Resources, of this EIR.
RR-4.2:Habitat Conservation. Support habitat conservation efforts to set aside and preserve suitable habitats, with priority given to habitats for rare and endangered species in accordance with state and federal resource agency requirements.	**Consistent:** This EIR provides a detailed overview of the applicable regulatory requirements to ensure the Project complies with all federal, State, and regional regulations for habitat and species protections. Additionally, this EIR includes an in-depth analysis of impacts for sensitive plants and wildlife, as well as habitat. Where impacts are identified, mitigation measures are presented to minimize, avoid, or compensate to the extent practicable. See Section 3.4, Biological Resources, of this EIR.

GENERAL PLAN POLICY	PROJECT CONSISTENCY
RR-4.3: Native Species. Conserve existing native trees and vegetation where possible and encourage the use of native species in development and infrastructure projects.	**Consistent:** The Specific Plan includes landscape architectures standards. Landscaping would be provided throughout the Plan Area, such as along roadways, paths, and parks. Tree species with invasive characteristics would be avoided. When selecting plant species, species that would minimize maintenance challenges would be preferred. Evergreen shrubs would be utilized where appropriate for screening of fences or utility structures. A mix of deciduous and evergreen tree varieties would be utilized to create interest throughout the seasons. Traditional "lawn" species would be highly discouraged in parkway strips and should be limited to parks and public open spaces for recreational use. Further, deep rooting species that use less water would be utilized when "lawn" species are used.
RR-4.4: Natural Water Bodies and Drainage Systems. Limit the disturbance of natural water bodies and drainage systems in Lathrop by conserving natural open space areas, protecting channels, and minimizing the impacts from stormwater and urban runoff.	**Does not Conflict:** There are no natural water bodies onsite; however, the San Joaquin River is located adjacent to the north, northwest, west, southwest, and south of the Project site. In order to limit the disturbance to the River, the Project includes park and open space as a buffer area between the residential uses and the River. Additionally, the Project includes a stormwater drainage system which would minimize the impacts from stormwater and runoff.
RR-4.6: Urban Forest. To the extent feasible, build upon existing streetscapes and develop an urban forest along the City's major corridors and in residential neighborhoods to provide avian habitat, sequester carbon emissions, foster pedestrian activity, and provide shade.	**Consistent:** As noted previously, landscaping would be provided throughout the Plan Area, such as along roadways, paths, and parks. Each major road right-of-way will include street trees, which will be a mixture of evergreen and deciduous varieties best suited to the climate, spaced 30 to 40 feet on center. Every residential lot will have a minimum of one street tree. The park spaces will include street trees, accent trees, and low water use shrubs and turf.
RR-4.11: Development. Require that all new development identify potential impacts to existing biological resources and provide mitigation measures as necessary pursuant to CEQA in order to protect these resources from negative externalities.	**Consistent:** This EIR provides a detailed overview of the applicable regulatory requirements to ensure the Project complies with all federal, State, and regional regulations for habitat and species protections. Additionally, this EIR includes an in-depth analysis of impacts for sensitive plants and wildlife, as well as habitat. Where impacts are identified, mitigation measures are presented to minimize, avoid, or compensate to the extent practicable. See Section 3.4, Biological Resources, of this EIR.
RR-7d: Review and regulate new development, infrastructure, and levee improvement projects to ensure consistency with Federal and State flood and floodway requirements, including BDCP and Delta Plan policies as applicable.	The proposed Project is subject to the SJMSCP. The proposed Project does not conflict with the SJMSCP. Mitigation Measure 3.4-2 in Section 3.4 of this EIR requires participation in the SJMSCP.

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
RR-8.7: Groundwater Recharge. Promote the use of permeable surface materials and provide for ample areas of open space, including parks and greenways, and naturalized land, in order to decrease surface runoff and promote groundwater recharge.	**Consistent:** The proposed Project would result in new impervious surfaces and could reduce rainwater infiltration and groundwater recharge. The collection of rainwater for those areas of impervious surfaces will be routed into the proposed Project's storm drainage system. Stormwater would be gravity fed and eventually flow to the proposed retention basin. Once at the retention basin, water would percolate to underground groundwater stores. As discussed in Impact 3.9-2 in Section 3.9, Hydrology and Water Quality, the Project would not decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin.
PUBLIC SAFETY	
PS-1.1. Geologic Hazard Identification. Review and monitor geologic and seismic hazards maps in concert with updates from the California Geologic Survey and local surveys.	**Consistent.** Project design would be subject to the California Building Code (CBC), which includes applicable safety and design standards related to geologic hazards. Additionally, a geotechnical evaluation has been completed for the Project, consistent with Sections 1803.1.1.2, 1803.5.11. and 1803.5.12 of the CBC. The geotechnical evaluation includes a review of hazard maps as well as soil sampling. See Section 3.6, Geology and Soils, of this EIR for discussions pertaining to geologic and seismic hazards.
PS-1.2 Earthquake Protection. Enforce State seismic design standards and guidelines and all relevant building codes to reduce the risk of damage associated with seismic activity.	**Consistent.** Project design would be subject to the CBC, which includes applicable safety and design standards related to seismic activity. Additionally, as discussed in Impact 3.6-1, the proposed Project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides. See Section 3.6, Geology and Soils, of this EIR for discussions pertaining to seismic hazards.
PS-1.3 Development. Require special site-specific studies, generally including but not limited to, soil compaction tests and geotechnical reports, for development projects and City improvement projects to determine the nature and extent of possible liquefaction, landslides, and geologic hazards, and to identify engineering and development siting measures to permit development to occur.	**Consistent.** As discussed in Section 3.6, in accordance with the City's Subdivision Ordinance (Title 16), a preliminary soil report and geologic report prepared by a geotechnical engineer must be submitted to the City along with the Project final map. The geotechnical evaluation would include design recommendations to ensure that geologic and soil conditions do not pose a threat to the health and safety of people or structures.

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
PS-1.4 Development Inspection. Require professional inspection of foundation, excavation, earthwork, and other geotechnical aspects of site development during constructions on those sites specified in geotechnical studies as being prone to seismic or geologic hazard.	**Consistent.** As discussed above, a geotechnical evaluation will be completed for the Project, consistent with the City's Subdivision Ordinance (Title 16). The evaluation will include building requirements and recommendations.
PS-1.6 Title 24 Compliance. Require all structures located within areas containing expansive soils to be designed and engineered to comply with the California Code of Regulations (CCR), Title 24.	**Consistent.** According to the Lathrop General Plan EIR, the soils in Project site generally have a low to moderate shrink-swell potential. Project design would be subject to the California Code of Regulations (CCR), Title 24.
PS-2.1 Building Fire Codes. Require that all buildings and facilities within the city comply with local, state, and federal regulatory standards such as the California Building and Fire Codes, as well as other applicable fire safety standards, to minimize the risk of fire in the city.	**Consistent.** The proposed Project would be subject to the California Building Code, which requires the California Fire Code. In addition, Project design would be reviewed by the City and fire department for opportunities to use building and site design features as a means for fire prevention and reduction.
PS-2.2 Fire Protection Services. Coordinate with the Lathrop Manteca Fire Protection District (LMFD) in the provision of fire protection services to serve the city's current and future population and development.	**Consistent.** Impacts on Public Services and Recreation are discussed in Section 3.12. The city has adequate fire department capacity to provide fire protection services to the proposed Project.
PS-2.5: Roadway Design and Maintenance. Design and maintain roadways to maintain acceptable emergency vehicle response times.	**Consistent:** As discussed in Impact 3.13-4 in Section 3.13, the Project is designed to allow access for emergency vehicles into the Project site and would not impair emergency response.
PS-2.6: Water Supply. Ensure that new development is served with adequate water volumes and water pressure to support fire protection, including minimum required fire flow standards for commercial, industrial and residential areas.	**Consistent.** Impacts on utilities infrastructure (including water infrastructure and supplies) are discussed in Section 3.14, Utilities and Service Systems. The city has adequate water supply capacity to provide water services to the proposed Project.
PS-3.4: Evaluate Hazards. Require evaluation of potential flood hazards prior to approval of development projects to determine whether the proposed development is reasonably safe from flooding and consistent with California Department of Water Resources Urban Level of Flood Protection Criteria (ULOP). The City shall not approve the execution of a development agreement, a tentative map, or a parcel map for which a tentative map is not required, or a	**Consistent**: Impacts associated with potential flood events are discussed in Section 3.9, Hydrology and Water Quality, of this EIR. As shown on Figure 3.9-2, the Development Area is not within the 100- or 500-year flood hazard zones. While portions of the Project site outside of the Development Area are located in the 100-year flood zone, these portions would be open space as part of the Project. Development of urban uses within the 100-year flood zone would not occur as a result of the Project. As noted previously, the Project site is within Zone X, Area with Reduced Risk Due to Levee. However, pursuant to the City Municipal Code, the proposed Project would be required

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
discretionary permit or other discretionary entitlement that would result in the construction of a new building, or construction that would result in an increase in allowed occupancy for an existing building, or issuance of a ministerial permit that would result in the construction of a new residence for property that is located within a 200-year flood hazard zone, unless the adequacy of flood protection as described in Government Code §65865.5(a), 65962(a), or 66474.5(a), has been demonstrated.	to comply with regulations contained in Chapter 17.17 (200-Year Flood Protection) of the City Municipal Code.
PS-3.5 New Development. New development may be permitted in areas not identified as "urban" or "urbanizing" provided that: **1. Such areas are protected from 100-year flooding by FEMA-accredited levees or equivalent flood protection as shown on an adopted FEMA Flood Insurance Rate Map, a FEMA-approved Letter of Map Revision or a Conditional Letter of Map Revision, subject to conditions specified in the letter; or** **2. Where not protected by FEMA-accredited 100-year levees, such areas are subject to all applicable requirements of Municipal Code Chapter 8.30 (Floodplain Management), the California Building Standards Code as adopted by the City, and the latest promulgated FEMA standards for development in the 100-year floodplain, provided that new development is defined as "urban" or "urbanizing."**	**Consistent**: As discussed previously, the Project site is currently located in Zone X, protected by levee, which by definition indicates an area protected by levees from the 1% annual chance flood.
PS-3.7 Mitigation. Require all development projects to demonstrate how storm water runoff will be detained or retained on-site, treated, and/or conveyed to the nearest drainage facility as part of the development review process. Project applicants shall demonstrate that project implementation would not result in increases in the peak	**Consistent.** Impacts on utilities infrastructure (including storm drainage) are discussed in Section 3.14, Utilities and Service Systems. As discussed, development of the proposed Project would include construction of a new storm drainage system. The stormwater drainage system will be constructed to meet the City of Lathrop Standards. Storm drain lines for the proposed Project would be extended throughout the Project site to the retention basins. Project implementation would not result in

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
flow runoff to adjacent lands or drainage facilities that would exceed the design capacity of the drainage facility or result in an increased potential for offsite flooding.	increases in the peak flow runoff to adjacent lands or drainage facilities that would exceed the design capacity of the drainage facility or result in an increased potential for offsite flooding.
PS-3.8: Construction Activities. Ensure that construction activities will not result in adverse impacts to existing flood control and drainage facilities, and adequate drainage and erosion control measures are provided during construction of new development.	**Consistent:** The Project includes use of detention basins to accommodate runoff from the proposed development. Additionally, the proposed storm drain system will include water quality features designed in conformance with the standards of the Regional Water Quality Control Board for the Central Valley Region and the City of Lathrop. Stormwater regulations for construction projects using Best Management Practices will be incorporated into the design.
PS-3.9: Adequate Infrastructure. Maintain and regularly assess the status of local storm drainage infrastructure to ensure that the system is functioning property.	**Consistent.** Impacts on utilities infrastructure including storm drainage) are discussed in Section 3.14, Utilities and Service Systems. As discussed, development of the proposed Project would include construction of a new storm drainage system. The stormwater drainage system will be constructed to meet the City of Lathrop Standards. Storm drain lines for the proposed Project would be extended throughout the Project site to the retention basins.
PS-4.2: Reduction. Encourage producers and users of hazardous materials to reduce the amount of hazardous materials produced and used.	**Consistent:** The Project would adhere to all local, state, and federal regulations governing the storage and handling of hazardous materials. The County Office of Emergency Services prepared a Hazardous Materials Area Plan (Chapter 4 of Division 2, Title 19, Article 3, §2720-2728 of the California Code of Regulations) and (California Health and Safety Code, Division 20, Chapter 6.95, Section 25503.5) that describes the hazardous materials response system developed to protect public health, prevent environmental damage and ensure proper use and disposal of hazardous materials. The plan establishes effective response capabilities to contain and control releases, establishes oversight of long-term cleanup and mitigation of residual releases, and integrates multi-jurisdiction and agency coordination. This plan is implemented by the San Joaquin County Environmental Health Department.
PS-4.3: Storage. Require the storage of hazardous materials in safe manner.	**Consistent:** The Project does not propose uses that would involve the use or storage of hazardous substances other than limited quantities of hazardous materials such as solvents, fertilizers, pesticides, and other materials used for regular household maintenance of buildings and landscaping. The quantities of these materials would not typically be at an amount that would pose a significant hazard to the public or the environment. The Project

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
	would adhere to all local, state, and federal regulations governing the storage and handling of hazardous materials.
PS-4.4: Regulations. Ensure that the LMFD continues to enforce the Uniform Fire Code relating to the use of hazardous material and require the appropriate regulations to be followed and precautions taken for the type and amount of hazard being created, used, stored, and/or disposed.	**Consistent.** The proposed Project would be subject to the California Building Code, which requires the California Fire Code. In addition, Project design would be reviewed by the City and fire department for opportunities to use building and site design features as a means for fire prevention and reduction. As discussed previously, the County Office of Emergency Services prepared a Hazardous Materials Area Plan (Chapter 4 of Division 2, Title 19, Article 3, §2720-2728 of the California Code of Regulations) and (California Health and Safety Code, Division 20, Chapter 6.95, Section 25503.5) that describes the hazardous materials response system developed to protect public health, prevent environmental damage and ensure proper use and disposal of hazardous materials. The plan establishes effective response capabilities to contain and control releases, establishes oversight of long-term cleanup and mitigation of residual releases, and integrates multi-jurisdiction and agency coordination. This plan is implemented by the San Joaquin County Environmental Health Department.
PS-4.5: Hazardous Materials Business Plan. Coordinate with the LMFD to ensure that businesses in the city which handle hazardous materials prepare and file a Hazardous Materials Business Plan (HMBP). The HMBP shall consist of general business information, basic information on the location, type, quantity, and health risks of hazardous materials, and emergency response and training plans.	**Consistent.** Impacts on public services and recreation are discussed in Section 3.12 and impacts related to hazardous waste are discussed in Section 3.8. The Project does not propose uses that would involve the use or storage of hazardous substances other than limited quantities of hazardous materials such as solvents, fertilizers, pesticides, and other materials used for regular household maintenance of buildings and landscaping. The quantities of these materials would not typically be at an amount that would pose a significant hazard to the public or the environment. As discussed previously, the County Office of Emergency Services prepared a Hazardous Materials Area Plan (Chapter 4 of Division 2, Title 19, Article 3, §2720-2728 of the California Code of Regulations) and (California Health and Safety Code, Division 20, Chapter 6.95, Section 25503.5) that describes the hazardous materials response system developed to protect public health, prevent environmental damage and ensure proper use and disposal of hazardous materials. The plan establishes effective response capabilities to contain and control releases, establishes oversight of long-term cleanup and mitigation of residual releases, and integrates multi-jurisdiction and agency coordination. This plan is implemented by the San Joaquin County Environmental Health Department.

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
PS-4.6: Cleanup Sites. Require that the hazardous material transporter and/or the party responsible for the release, coordinates with the San Joaquin County Environmental Health Department, LMFD, and other agencies as needed, to confirm that hazardous waste cleanup sites located within the city are remediated with the property owner in a manner that keeps the public safe.	**Does Not Conflict:** The Project site does not include an existing hazardous clean-up site.
PS-4.7: Emergency Response. Work with the LMFD and other responding agencies to ensure that emergency personnel respond safely and effectively to a hazardous materials incident in the city.	**Consistent.** As discussed in Section 3.13, Transportation and Circulation, the Specific Plan is designed to ensure that adequate emergency access is provided by providing two major points of ingress/egress to the development. The Specific Plan has a roadway network that is designed consistent with the City's General Plan, and it includes street sections that provide function and structure for the development. Each individual phase and/or site that is developed within the Specific Plan Area would be reviewed by the City to ensure that it is designed with adequate emergency access. Therefore, emergency personnel can respond safely and effectively to a hazardous materials incident at the Project site.
PUBLIC FACILITIES AND SERVICES ELEMENT	
PFS-1.8 Cost Recovery. Recover the direct upfront costs and indirect long-term costs of providing services and facilities to new development through a combination of fees, exactions, and other methods based on an evaluation of long-term economic benefits and in a manner consistent with the City's cost recovery goals.	**Consistent.** The Project would be subject to Development Fees outlined in the Master Fee Schedule. These development fees would be used by the City and utility providers to finance public facility design, construction, operation, and maintenance.
PFS-1.12 Infrastructure Rehabilitation. Prioritize the regular maintenance and rehabilitation of public facilities and critical Demonstrate Capacity. Require new development to demonstrate that the City's public services and facilities can accommodate the increased demand for said services and facilities associated with the project as part of the entitlement process.	**Consistent.** The Project would be subject to Development Fees outlined in the Master Fee Schedule. These development fees would be used by the City and utility providers to finance public facility design, construction, operation, and maintenance. As discussed in Section 3.12, Public Services and Recreation, the public services (police, fire, parks, and schools) are adequate to serve the Project.
PFS-1.13 Mitigate Impacts. Require new development to offset or mitigate impacts to community services and facilities to ensure that service levels for existing users are not degraded or impaired by new development, to the	**Consistent.** The Project would be subject to Development Fees outlined in the Master Fee Schedule. These development fees would be used by the City and utility providers to finance public facility design, construction, operation, and maintenance. As discussed in Section 3.12, Public Services and Recreation, the public services (police,

General Plan Policy	*Project Consistency*
satisfaction of the City.	fire, parks, and schools) are adequate to serve the Project.
PFS-2.6 Fair Share Cost. Ensure that all new development provides for and funds a fair share of the costs for adequate water source, distribution, including line extensions, easements, and water treatment plant expansions.	**Consistent.** As discussed above, the Project would provide all necessary infrastructure required to serve the Project site. The Project would be subject to Development Fees outlined by the City. These development fees would be used by the City and utility providers to finance public facility design, construction, operation, and maintenance.
PFS-3.1 Wastewater Infrastructure. Ensure adequate wastewater collection and treatment infrastructure to serve existing and future development.	**Consistent.** Impacts on utilities infrastructure, including wastewater, are discussed in Section 3.14, Utilities and Service Systems. The Project would provide all necessary infrastructure required to serve the Project site. The infrastructure improvements are consistent with City infrastructure plans and capacity requirements.
PFS-3.5 Development Review. Review new development applications in order to ensure that new growth does not exceed the availability of adequate sewage treatment capacity or predate the presence of necessary infrastructure.	**Consistent.** Impacts on utilities infrastructure, including wastewater, are discussed in Section 3.14, Utilities and Service Systems. The Project would provide all necessary infrastructure required to serve the Project site. The infrastructure improvements are consistent with City infrastructure plans and capacity requirements. The Project would not result in exceedance of the treatment capacity of the local sewage treatment plant.
PFS-3.6 Fair Share Cost. Ensure that all new developments provide for and fund their fair share of the costs for adequate sewer collection, treatment and disposal, including line extensions, easements, and dedications.	**Consistent.** As discussed above, the Project would provide all necessary infrastructure, including wastewater infrastructure, required to serve the Project site. The Project would be subject to Development Fees outlined by the City. These development fees would be used by the City and utility providers to finance public facility design, construction, operation, and maintenance.
PFS-4.1: Maintain Capacity. Maintain and improve storm drainage infrastructure and flood control facilities in order to protect the community from flood hazards.	**Consistent.** As discussed in Section 3.14, Utilities and Services Systems, the proposed storm drainage system is adequate to serve the Project and would not result in off-site flooding impacts. Additionally, the Project would be subject to Development Fees outlined in the Master Fee Schedule. These development fees would be used by the City and utility providers to finance public facility design, construction, operation, and maintenance.
PFS-4.3: Maintenance Districts. Continue to fund the operation and maintenance of stormwater facilities and regulatory compliance through the creation of maintenance districts and/or other appropriate mechanisms that avoid burdening the City's finances.	**Consistent.** As discussed above, the proposed storm drainage system is adequate to serve the Project and would not result in off-site flooding impacts. Additionally, the Project would be subject to Development Fees outlined in the Master Fee Schedule. These development fees would be used by the City and utility providers to finance public facility design, construction, operation, and maintenance.
PFS-4.5: Development Review. Continue to require all development projects to: **A. Demonstrate how storm water**	**Consistent:** The Project includes use of detention basins to accommodate runoff from the proposed development. The drainage retention basins have been sized to accommodate runoff from a 100-year, 24-hour storm

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
runoff will be detained or retained on-site and/or conveyed to the nearest drainage facility as part of the development review process and as required by the City's Small MS4 Phase 2 permit; and **B. Analyze their drainage and stormwater conveyance impacts and either demonstrate that the City's existing infrastructure can accommodate increased stormwater flows, or make the necessary improvements to mitigate all potential impacts.**	event. Additionally, the proposed storm drain system will include water quality features designed in conformance with the standards of the Regional Water Quality Control Board for the Central Valley Region and the City of Lathrop. Stormwater regulations for construction projects using Best Management Practices will be incorporated into the design.
PFS-4.6: Stormwater Runoff. Stormwater runoff may be directed towards permeable surfaces to the greatest extent feasible to allow for more percolation of stormwater into the ground.	**Consistent:** The Project includes use of detention basins to accommodate runoff from the proposed development. Stormwater runoff collected at the basin would percolate into the ground.
PFS-4.7: Stormwater Capture. Encourage the use of professionally designed stormwater capture methods to aid in the reuse of rainwater for non-potable uses in compliance with applicable State regulations.	**Consistent:** As discussed previously, the Project includes use of detention basins to accommodate runoff from the proposed development. Additionally, the proposed storm drain system will include water quality features designed in conformance with the standards of the Regional Water Quality Control Board for the Central Valley Region and the City of Lathrop. Stormwater regulations for construction projects using Best Management Practices will be incorporated into the design.
PFS-4.8: Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.	**Consistent:** As discussed previously, the Project includes use of detention basins to accommodate runoff from the proposed development. Additionally, the proposed storm drain system will include water quality features designed in conformance with the standards of the Regional Water Quality Control Board for the Central Valley Region and the City of Lathrop. Stormwater regulations for construction projects using Best Management Practices will be incorporated into the design.
PFS-4.9: Naturalized Stormwater Facilities. Maintain stormwater facilities in a naturalized condition where appropriate, incorporating recreational trails, parkway vegetation, and other amenities, minimizing grading, and ensuring that vegetation does not reduce channel capacity, and consistent with the Recreation and Resources Element.	**Consistent.** The Project includes storm water retention basins which would be located throughout the Project site. Storm drain lines for the proposed Project would be extended throughout the Project site to the retention basin. Existing naturalized stormwater facilities are not found on-site. The Project also includes ample trails and open space areas throughout the site, including in the portions of the site along the San Joaquin River.
PFS-4.10: Dual-Use Detention Basins. Allow recreational uses in dual-use	**Does Not Conflict.** The Project does not include dual-use detention basins.

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
detention basins for parks, ball fields, and other uses where appropriate.	
PFS-5.4 New Development. Continue to require new development and redevelopment to provide verification from energy providers that states they are able to accommodate the additional demand for service.	**Consistent.** The proposed Project would be in compliance with all applicable federal, State, and local regulations regulating energy usage. For example, PG&E, the electric providers to the proposed Project, are responsible for the mix of energy resources used to provide electricity for its customers, and it is in the process of implementing the statewide RPS to increase the proportion of renewable energy (e.g. solar and wind) within its energy portfolio. The proposed Project would also be required to implement the applicable Title 24 energy efficiency requirements, as well as other State requirements, such as the California Solar Mandate, as well as all applicable regional and local requirements that affect energy efficiency.
PFS-7.1 Fire Facilities. Encourage the Lathrop Manteca Fire Protection District (LMFD) to maintain adequate staff and equipment to provide efficient, high quality, and responsive fire protection, police protection, and emergency medical services to existing and future growth in the city.	**Consistent.** The Project would be subject to Development Fees outlined in the Master Fee Schedule. These development fees would be used by the City and utility providers to finance public facility design, construction, operation, and maintenance. Payment of the applicable impact fees by the Project applicant and ongoing revenues that would come from property taxes, sales taxes, and other revenues generated by the Project, would fund these police, fire, and emergency medical service needs created by the proposed Project. As discussed in Section 3.12, all impacts pertaining to police and fire services would be less than significant.
PFS-7.2 Emergency Response Times. Work cooperatively with the LMFD and providers of emergency medical services to ensure acceptable response times in accordance with provider standards.	**Consistent:** As discussed in Section 3.13, Transportation and Circulation, the Specific Plan is designed to ensure that adequate emergency access is provided by providing two major points of ingress/egress to the development. The Specific Plan has a roadway network that is designed consistent with the City's General Plan, and it includes street sections that provide function and structure for the development. Each individual phase and/or site that is developed within the Specific Plan Area would be reviewed by the City to ensure that it is designed with adequate emergency access. Therefore, emergency personnel can respond safely and effectively to a hazardous materials incident at the Project site. All intersections and street sections would be reviewed by the City of Lathrop and designed to comply with typical City standards.
PFS-7.4 Roadway Design and Maintenance. Design and maintain roadways to maintain acceptable emergency vehicle response times.	**Consistent:** As noted above, the Specific Plan is designed to ensure that adequate emergency access is provided by providing two major points of ingress/egress to the development. The Specific Plan has a roadway network that is designed consistent with the City's General Plan,

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
	and it includes street sections that provide function and structure for the development. Each individual phase and/or site that is developed within the Specific Plan Area would be reviewed by the City to ensure that it is designed with adequate emergency access. All intersections and street sections would be reviewed by the City of Lathrop and designed to comply with typical City standards.
PFS-7.5 Department Consultation. Coordinate with LMFD and the Lathrop Police Department in the review of new development applications to ensure that adequate attention is being paid to fire and safety concerns during the design and planning of a project.	**Consistent.** The Project would be subject to review to all various City departments for comment and conditions prior to final approval.
PFS-7.8 Site Design. Recognize the role of site design in crime prevention and implement best practices into existing plans and new development strategies.	**Consistent.** The Project includes pedestrian-scale lighting that would aid in crime prevention practices.
PFS-7.9 Technology. Encourage and support efforts to improve police, fire, and emergency medical services through improved use of modern technology and industry best practices.	**Consistent.** The Project would be subject to Development Fees outlined in the Master Fee Schedule. These development fees would be used by the City and utility providers to finance public facility design, construction, operation, and maintenance. Payment of the applicable impact fees by the Project applicant, and ongoing revenues that would come from property taxes, sales taxes, and other revenues generated by the Project, would assist in funding efforts to improve police, fire, and emergency medical services through updating technology.
PFS-8.2 Adequate Facilities. Continue to engage Manteca Unified School District (MUSD) in the environmental review process for land use changes so that they can provide adequate educational opportunities for all students in a timely manner in accordance with the pace of residential development.	**Consistent.** The NOP for the proposed Project was provided to the MUSD. As discussed in Impact 3.12-4 in Section 3.12, based on MUSD's student generation factors, the Project's 912 dwelling units would conservatively generate approximately 271 new elementary school students, 81 middle school students, and 170 high school students. Utilizing the more realistic development estimate of 829 dwelling units, the Project would generate approximately 246 new elementary school students, 73 middle school students, and 155 new high school students. MUSD collects impact fees from new developments under the provisions of SB 50. Under Section 65996 of the California Government Code, the payment of fees under SB 50 is deemed to fully mitigate the impacts of new development on school facilities. These development fees would be used by the school district to finance facility design, construction, operation, and maintenance.

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
PFS-8.5 Financing and Proportionate Share. Encourage the local school districts to properly collect required development fees so that new development funds its proportionate share of the Districts' costs for new school facilities.	**Consistent.** As noted above, the Project would increase the number of MUSD students. MUSD collects impact fees from new developments under the provisions of SB 50. Under Section 65996 of the California Government Code, the payment of fees under SB 50 is deemed to fully mitigate the impacts of new development on school facilities. These development fees would be used by the School district to finance facility design, construction, operation, and maintenance.
PFS-9.2 Source Reduction and Recycling Program. Implement and enforce the provisions of the City's Source Reduction and Recycling Program.	**Consistent.** Impacts on utilities infrastructure (including solid waste) are discussed in Section 3.14, Utilities and Service Systems. The Project is subject to the City's Source Reduction and Recycling Program.
PFS-9.3 Compliance with State Legislation. Continue to comply with all State regulations regarding waste diversion, source reduction, recycling, and composting.	**Consistent.** Section 8.16 of the Lathrop Municipal Code provides rules and regulations regarding garbage collection and disposal. It includes a list of hazardous materials (8.16.050), prohibitions on the burning and burial of solid waste (8.16.060), rights of the City related to solid waste collection and transportation (8.16.090), a list of requirements for the contractor for solid waste collection and transportation (8.16.100), restrictions on solid waste collection and transportation (8.16.110), a description of billing and collection fees (8.16.160), the garbage collection rate schedule (8.16.170), permit requirements (8.16.190), and a description of fees and other requirements. The Project is subject to these requirements of the Municipal Code.
PFS-9.5 Waste Service Performance and Collection Facilities. Support efforts of the solid waste service provider to maintain adequate residential, commercial, and industrial solid waste and mixed recycling collection service levels and solid waste facilities in accordance with state law, and periodically review waste collection performance to verify adequacy of service.	**Consistent.** Impacts on utilities infrastructure (including solid waste) are discussed in Section 3.14, Utilities and Service Systems. As discussed in Section 3.14, Solid waste from Lathrop is primarily landfilled at the Forward Sanitary Landfill. The Forward Landfill has a daily permitted maximum of 8,668 TPD and a remaining capacity of over 24.7 million cubic yards as of 2020. The landfill has enough projected capacity to serve residents and businesses until approximately 2036. Other landfills that serve the City include the Foothill Sanitary Landfill and the Fink Road Landfill, which have enough projected capacity to serve residents and businesses until approximately 2082 and 2050, respectively. The addition of the volume of solid waste associated with the proposed Project, approximately 6.5 tons per day, would not exceed the Forward Landfill's remaining capacity. Existing landfills have permitted capacity to handle this additional waste.
PFS-9.6 Landfill Capacity. Continue to coordinate with San Joaquin County to ensure adequate landfill capacity in the region.	**Consistent.** As discussed previously, the Forward Sanitary Landfill has adequate capacity to provide solid waste services to the proposed Project.

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
PFS-9.9 Hazardous Waste. Promote the proper disposal of hazardous waste—including paint, tires, medications, medical sharps, infectious waste, asbestos waste, construction waste, and electronic waste; encourage materials to be recycled or disposed of in a manner that is safe for the environment, residents, and visitors to the city consistent with the Public Safety Element.	**Consistent.** The Project does not propose uses that would involve the use or storage of hazardous substances other than limited quantities of hazardous materials such as solvents, fertilizers, pesticides, and other materials used for regular household maintenance of buildings and landscaping. The quantities of these materials would not typically be at an amount that would pose a significant hazard to the public or the environment.
PFS-10.5 Infrastructure. As feasible, require recycled water infrastructure including purple pipes to encourage the future use of reclaimed water for urban landscapes to be included in new development and infrastructure projects.	**Consistent.** Impacts on utilities infrastructure (sewer, water, storm drainage, and solid waste) are discussed in Section 3.14, Utilities and Service Systems. Utility lines within the Project site and adjacent roadways would be extended throughout the Project site. The Project would utilize recycled water service when it becomes available.
NOISE ELEMENT	
N-1.3: Indoor Residential Noise Level. Ensure that new development does not result in indoor noise levels exceeding 45 dBA Ldn for residential uses by requiring the implementation of construction techniques and noise reduction measures for all new residential development.	**Consistent.** Impacts on Noises are discussed in Section 3.11. As discussed in the Impact 3.11-1 impact analysis, the proposed Project would include typical residential noise which would be compatible with the existing adjacent residential uses. Construction noise impacts would be less-than-significant with implementation of Mitigation Measure 3.11-1.
N-1.4: Acoustical Studies. For projects that are required to prepare an acoustical study, the following stationary and transportation noise source criteria shall be used to determine the significance of those impacts. **A. Stationary and Non-Transportation Noise Sources – A significant impact will occur if the project results in an exceedance of the noise level standards contained in this element, or the project will result in an increase in ambient noise levels by more than 3 dB, whichever is greater.** **B. Transportation Noise Sources -** **1. Where existing traffic noise levels are less than 60 dB Ldn at the outdoor activity areas of noise-sensitive uses, a +5 dB Ldn increase in roadway noise levels will be considered significant;**	**Consistent.** Impacts on Noises are discussed in Section 3.11. As discussed in the Impact 3.11-1 and shown in Tables 3.11-9, 3.11-10 and 3.11-11, increases in traffic on the local roadway network are not predicted to cause significant increases in noise levels. Therefore, traffic noise impacts would be less-than-significant. Additionally, the proposed Project would include typical residential noise which would be compatible with the existing adjacent residential uses. Therefore, the project is consistent with all noise standards of the City of Lathrop.

GENERAL PLAN POLICY	*PROJECT CONSISTENCY*
2. Where existing traffic noise levels range between 60 and 65 dB Ldn at the outdoor activity areas of noise-sensitive uses, a +3 dB Ldn increase in roadway noise levels will be considered significant; and **3. Where existing traffic noise levels are greater than 65 dB Ldn at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB Ldn increase in roadway noise levels will be considered significant.**	
N-1.15: Construction Noise. Require construction activities to reduce noise impacts on adjacent uses to the criteria identified in Table N-3 (Table 3.11-4), or, if the criteria cannot be met, to the maximum extent feasible complying with Title 15 of the LMC (Building and Construction) and use best practices. Construction activities outside of the permitted construction hours identified in the LMC may be approved on a case-by-case basis by the Building Official.	**Consistent.** Impacts on Noises are discussed in Section 3.11. As discussed in the Impact 3.11-1, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet. Construction activities would also be temporary in nature and are anticipated to occur during normal daytime working hours. In addition, Mitigation Measure 3.11-1 requires that construction activities are limited to certain hours, construction equipment is properly maintained, equipment idling is limited, and stationary equipment is located away from noise-sensitive uses. Therefore, the Project is consistent with all noise standards of the City of Lathrop.
ENVIRONMENTAL JUSTICE	
EJ-1.1 Land Use Patterns. Create land use patterns that are transit, bicycle, and pedestrian-oriented and have a mix of uses, especially neighborhood serving businesses, within walking distance of homes and workplaces.	**Consistent:** The Project provides facilities and amenities which serve all modes of transportation. As discussed previously, the Specific Plan will include bicycle, pedestrian, and transit facilities to increase access to transportation choices and increase safety for walking and biking. Pedestrian walkways would be provided along all local streets. Class II bike lanes will be provided along the proposed arterial and collector streets. A multi-use trail with a Class I bike path would be provided along the San Joaquin River. Additionally, two bus stops are proposed along Street W.

SOURCE: DE NOVO PLANNING GROUP, 2023.

As such, implementation of the proposed Project will have a ***less than significant*** impact relative to this topic.

SB 330

The Plan Area has been identified in the City of Lathrop's General Plan for future residential growth. The Project proponent has taken the initiative to study the whole area, design a land use mix that is intended to meet a much-needed market while accommodating the site constraints, and plan for the appropriate public services, infrastructure, and amenities needed to support the community. The long-range planning effort will require a General Plan Amendment to ensure that the General Plan and Specific Plan are consistent.

As noted, the Specific Plan would result in some changes in land use, including changes to residential land uses. The proposed land use changes are largely a reshuffling of the existing land uses to accommodate various engineering challenges (i.e., topography, ingress/egress, etc.), and to create a design pattern for improved form and function. However, the proposed reshuffling of land uses technically involves upzoning/downzoning of residential land which is regulated by SB 330. SB 330 freezes the ability of local governments to downzone, adopt new development standards, or change land-use in residential and mixed-use areas if the change results in less-intensive uses.

The proposed Project will include a General Plan Amendment from LD to LD, P, and O. The increase in park and open space land uses would result in a net reduction of low density residential land uses compared to the existing General Plan.

Under the existing General Plan, the Specific Plan Area would allow for 1,171 residential units at maximum density. Under the proposed land use changes, the Specific Plan Area would allow for up to 912 residential units at maximum density. Based on the design concept, which involves a reshuffling of the residential land uses within the Specific Plan Area, the maximum residential unit count is decreased from what would be allowed under the existing General Plan. This is not consistent with the requirements of SB 330, in that it would result in a net loss of residential capacity for the City.

It is noted that the above SB 330 discussion is based on maximum units allowed using density of gross acres. However, due to various constraints (i.e., topography), infrastructure needs (i.e., roadways and storm drainage basins), the net developable land would not permit for development of the maximum allowed units. The Specific Plan does not include any restrictions, regulations, guidelines, standards, or policies, and would restrict residential development to the maximum allowed under the land use designation, rather, the Specific Plan represents an accurate depiction of what is anticipated to be built based on professional planners and engineers having studied the realities of the Specific Plan Area. The SB 330 discussion chose gross acreage for a point of comparison because gross acreage is used in the General Plan.

It is noted, however, that SB 330 was not adopted to avoid or mitigate an environmental effect.

LATHROP ZONING CODE

The Zoning Ordinance has been established to promote and protect the public health, safety, and general welfare of the community. Among the various objectives of the Zoning Ordinance include the promotion of development at appropriate densities/ floor area ratios in order to conserve and enhance the City's physical scale and character as defined in the General Plan. The City of Lathrop's Zoning Ordinance includes land use, development densities and development standards.

The proposed Project will include a rezone from RL-MV and P-MV to RL-MV, P-MV (Park, Mossdale Village Combining District), and OS-MV (Open Space, Mossdale Village Combining District). The proposed uses are consistent with the proposed zoning. Implementation of the proposed Project will have a ***less than significant*** impact relative to this topic.

Impact 3.10-3: The proposed Project has the potential to induce substantial population growth in an area. (Less than Significant)

Section 15126.2(d) of the CEQA Guidelines requires that an EIR evaluate the growth-inducing impacts of a proposed action. A growth-inducing impact is defined by the CEQA Guidelines as:

> *The way in which a proposed Project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth…It is not assumed that growth in an area is necessarily beneficial, detrimental, or of little significance to the environment.*

Section 15126 of the State CEQA Guidelines requires that all aspects of a project be considered when evaluating its impact on the environment, including planning, acquisition, development, and operation. As part of this analysis, the EIR must also identify growth-inducing impacts of the Project. Although growth inducement itself is not considered an environmental effect, it could potentially lead to foreseeable physical environmental effects.

Growth inducement can generally be considered any growth that exceeds planned growth of an area and results in new development that would not have taken place without implementation of the project. A project can have direct or indirect growth inducement potential. Direct growth inducement would result if a project, for example, involved construction of new housing. A project would have indirect growth inducement potential if it established substantial new permanent employment opportunities (e.g., commercial, industrial, or governmental enterprises) or if it would involve a construction effort with substantial short-term employment opportunities that would indirectly stimulate the need for additional housing and services to support the new employment demand (*Napa Citizens for Honest Government v. Napa County Board of Supervisors* (2001) 91 Cal.App.4th 342). Similarly, a project would indirectly induce growth if it would remove an obstacle to additional growth and development, such as removing a constraint on a required public service.

A project providing an increased water supply or wastewater treatment/collection in an area where this service historically limited growth could be considered growth-inducing.

The State CEQA Guidelines further explain that the environmental effects of induced growth are considered indirect impacts of the proposed action. (CEQA Guidelines Section 15358[b].) These indirect impacts or secondary effects of growth may result in significant, adverse environmental impacts. Potential secondary effects of growth include increased demand on other community and public services and infrastructure, increased traffic and noise, and adverse environmental impacts such as degradation of air and water quality, degradation or loss of plant and animal habitat, and conversion of agricultural and open space land to developed uses.

Growth inducement may constitute an adverse impact if the growth is not consistent with or accommodated by the land use plans and growth management plans and policies for the area affected. Local land use plans typically provide for land use development patterns and growth policies that allow for the orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer service, and solid waste service.

Components of Growth: The timing, magnitude, and location of land development and population growth in a region are based on various interrelated land use and economic variables. Key variables include regional economic trends, market demand for residential and non-residential uses, land availability and cost, the availability and quality of transportation facilities and public services, proximity to employment centers, the supply and cost of housing, and regulatory policies or conditions. Since the General Plan of a community defines the location, type, and intensity of growth, it is the primary means of regulating development and growth in California.

GROWTH EFFECTS OF THE PROJECT

Direct Population Growth: The proposed Project includes residential units that would result in direct population growth. The Department of Finance estimates an average of 3.48 people per household in Lathrop in 2024. Based on the anticipated number of residential units that will be built in the Project site (912 units), the population would be anticipated to increase by an estimated 3,173 persons. It is noted that the Vesting Tentative Map provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units / acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the analysis is conservative as the number of units constructed at buildout would likely be closer to 829, as shown on the Vesting Tentative Subdivision Map. Utilizing the 829 unit value, the population would be anticipated to increase by an estimated 2,884 persons.

The adopted General Plan designates land uses to ensure a balance between new residential development and jobs-creating uses. The General Plan assumed that development of the Specific Plan Area would occur and the General Plan has designated lands within the Specific Plan Area for development and urban uses on its Land Use Map. The direct population growth resulting from the Project is consistent with planned growth for Lathrop. Implementation of the proposed Project will have a ***less than significant*** impact relative to this topic.

Indirect Population Growth: As described above, projects that include employment generating uses have the potential to result in indirect population growth through the creation of jobs or the extension of infrastructure into areas that were not previously served.

Additionally, implementation of the proposed Project would provide job growth to the area. It is anticipated that local employment would be increased to provide park and trail maintenance jobs. The proposed Project is expected to require both full-time and part-time employees. It is anticipated that the employment growth would be met both by existing residents and through the attraction of new residents. Temporary construction-related jobs would also result from the Project.

The proposed Project would establish uses that can support some workforce of Lathrop and the local area. The proposed Project would not result in indirect population growth beyond the City's planned capacity, and would not be considered a major employer that would drive significant numbers of new residents to the area. Therefore, the proposed Project is not anticipated to exceed the planned growth (directly or indirectly) in the area beyond what is anticipated in the City of Lathrop General Plan. While the proposed Project will result in some indirect population growth, it is not anticipated to significantly induce growth. Implementation of the proposed Project will have a ***less than significant*** impact relative to this topic.

This section provides a general description of the existing noise sources in the Plan Area, a discussion of the regulatory setting, and identifies potential noise impacts associated with new development in the Specific Plan Area. Project impacts are evaluated relative to applicable noise level criteria and to the existing ambient noise environment. Where feasible, mitigation measures have been identified for significant noise-related impacts.

3.11.1 ENVIRONMENTAL SETTING

KEY TERMS

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.
CNEL	Community noise equivalent level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
$L_{(n)}$	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L_{50} is the sound level exceeded 50 percent of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
SEL	Sound exposure levels. A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.

FUNDAMENTALS OF ACOUSTICS

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60-dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. Table 3.11-1 lists several examples of the noise levels associated with common situations.

TABLE 3.11-1: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	*NOISE LEVEL (DBA)*	*COMMON INDOOR ACTIVITIES*
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. SEPTEMBER 2013.

EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a 1-dBA change cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING NOISE LEVELS

Existing Noise Receptors

Some land uses are considered more sensitive to noise than others. Land uses often associated with sensitive receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

Sensitivity is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. In the vicinity of the Project site, sensitive land uses include existing single-family residential uses located north, east, and south of the Project site. The River Islands Technology Academy is located approximately one-half mile from the southern boundary of the Project site.

Existing Ambient Noise Levels

The existing noise environment in the Plan Area is primarily defined by traffic on River Islands Parkway. To quantify the existing ambient noise environment in the vicinity of the Specific Plan Area, continuous (24-hour) noise level measurements were conducted on the Project site and a short-term noise level measurement at one location. Noise measurement locations are shown on Figure 3.11-1. A summary of the noise level measurement survey results is provided in Table 3.11-2. Appendix B of Appendix D contains the complete results of the noise monitoring.

TABLE 3.11-2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA

SITE	LOCATION	DATE/TIME	L_{DN}	AVERAGE MEASURED HOURLY NOISE LEVELS, DB					
				DAYTIME (7AM-10PM)			NIGHTTIME (10PM-7AM)		
				L_{EQ}	L_{50}	L_{MAX}	L_{EQ}	L_{50}	L_{MAX}
CONTINUOUS (24-HOUR) NOISE LEVEL MEASUREMENTS									
LT-1	50 feet to centerline of River Islands Parkway	8/25/22	69	68	63	85	61	50	76
LT-2	50 feet to centerline of Lathrop Road	3/21/24	49	48	39	66	41	40	51
LT-3	40 feet to centerline of Lathrop Road	3/21/24	51	48	39	69	44	41	60
SHORT-TERM NOISE LEVEL MEASUREMENTS									
ST-1	50 feet to centerline of River Islands Parkway	8/24/22	N/A	71	65	94	N/A	N/A	N/A

SOURCE: SAXELBY ACOUSTICS, 2024.

The sound level meters were programmed to record the maximum, median, and average noise levels at each site during the survey. The maximum value, denoted L_{max}, represents the highest noise level measured. The average value, denoted L_{eq}, represents the energy average of all of the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L_{50}, represents the sound level exceeded 50 percent of the time during the monitoring period.

Existing Traffic Noise Environment at Off-Site Receptors

OFF-SITE TRAFFIC NOISE IMPACT ASSESSMENT METHODOLOGY

To predict existing noise levels due to traffic, the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The model is based upon the Calveno reference noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. To predict traffic noise levels in terms of L_{dn}, it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Traffic volumes for existing conditions were obtained from the traffic data prepared for the Project. Truck percentages and vehicle speeds on the local area roadways were estimated from field observations.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations, sensitive receptors may not receive full shielding from noise barriers or may be located at distances which vary from the assumed calculation distance.

Table 3.11-3 shows the existing traffic noise levels in terms of L_{dn} at closest sensitive receptors along each roadway segment. A complete listing of the FHWA Model input data is contained in Appendix C of Appendix D.

TABLE 3.11-3: EXISTING TRAFFIC NOISE LEVELS

ROADWAY	*SEGMENT*	*EXTERIOR TRAFFIC NOISE LEVEL, DB L_{DN}*
Golden Valley Pkwy	South of Spartan Way	62.7
Lathrop Rd	North of Barbara Terry Rd	49.7
Louise Ave	East of I-5	66.4
McKee Blvd	West of Barbara Terry Blvd	51.6
River Islands Pkwy	West of Golden Valley Pkwy	62.6
River Islands Pkwy	West of McKee Blvd	57.5
River Islands Pkwy	West of Project Street C	55.2
Spartan Way	West of Golden Valley Pkwy	58.6

SOURCE: SAXELBY ACOUSTICS. 2024.

3.11.2 REGULATORY SETTING

STATE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, includes questions that indicate that a significant noise impact may occur if a project exposes persons to noise or vibration levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels. CEQA case law also addresses noise impacts. (See, e.g., *King & Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814, 883-894.) CEQA standards are discussed more below under the Thresholds of Significance section.

Governor's Office of Planning and Research

The State of California General Plan Guidelines (State of California 2017), published by the Office of Planning and Research (OPR), provides guidance for the acceptability of projects within specific CNEL or Ldn contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

LOCAL

City of Lathrop General Plan

The City of Lathrop General Plan Noise Element contains goals, policies, and implementation measures for assessing noise impacts within the City. Listed below are the noise policies pertaining to noise and vibration. The overarching goal for the environment is to ensure that noise does not substantially reduce the quality of urban life.

NOISE ELEMENT

Policy N-1.1. Noise Exposure. Consider the noise compatibility of existing and future development when making land use planning decisions. Require development and infrastructure projects to be consistent with the land use compatibility standards contained in Tables N-1 [Table 3.11-4], N-2 [Table 3.11-5], and N-3 [Table 3.11-6] to ensure acceptable noise exposure levels for existing and future development.

TABLE 3.11-4: LAND USE COMPATIBILITY STANDARDS (TABLE N-1 OF LATHROP GENERAL PLAN)

Land Use Category	*Community Noise Exposure L_{DN} or CNEL, dB*			
	Normally Acceptable[1]	*Conditionally Acceptable*[2]	*Normally Unacceptable*[3]	*Clearly Unacceptable*[4]
Residential – Low Density Single Family, Duplex, Mobile Homes	< or = 60	55 - 70	70-75	>75
Residential – Multi-Family	< or = 60	60 - 70	70-75	>75
Transient Lodging – Motels, Hotels	< or = 65	60 - 70	70-80	>80
Schools, Libraries, Religious Assemblies, Hospitals, Nursing Homes	< or = 70	60 - 70	70-80	>80
Auditoriums, Concert Halls, Amphitheaters	< or = 70	-	>65	-
Sports Arena, Outdoor Spectator Sports	< or = 75	-	>70	-
Playgrounds, Neighborhood Parks	< or = 70	-	67.5-75	>72.5
Golf Courses, Riding Stables, Water Recreation, Cemeteries	< or = 75	-	70 - 80	>80
Office Buildings, Business Commercial and Professional	< or = 70	67.5 – 72.5	>75	-
Industrial, Manufacturing, Utilities, Agriculture	< or = 75	70 – 80	>75	-

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE L_{DN} OR CNEL, DB			
	NORMALLY ACCEPTABLE[1]	CONDITIONALLY ACCEPTABLE[2]	NORMALLY UNACCEPTABLE[3]	CLEARLY UNACCEPTABLE[4]

1. Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
2. Conditionally Acceptable – New construction of development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
3. Normally Unacceptable – New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
4. Clearly Unacceptable – New Construction or development should generally not be undertaken.

SOURCE: CITY OF LATHROP GENERAL PLAN, NOISE ELEMENT, TABLE N-1.

TABLE 3.11-5: MOBILE SOURCE NOISE STANDARDS (TABLE N-2 OF LATHROP GENERAL PLAN)

LAND USE[1]	OUTDOOR ACTIVITY AREAS[2,3]	INTERIOR SPACES	
		L_{DN}/CNEL, DB	L_{EQ}, DB[4]
Residential	60	45	-
Motels/Hotels	65	45	-
Mixed-Use	65	45	-
Hospitals, Nursing Homes	60	45	-
Theaters, Auditoriums	-	-	35
Religious Assemblies	60	-	40
Office Buildings	65	-	45
Schools, Libraries, Museums	70	-	45
Playgrounds, Neighborhood Parks	70	-	-
Industrial	75	-	45
Golf Courses, Water Recreation	70	-	-

1. Where a proposed use is not specifically listed, the use shall comply with the standards for the most similar use as determined by the City.
2. Outdoor activity areas for residential development are considered to be the back yard patios or decks of single family units and the common areas where people generally congregate for multi-family developments. Where common outdoor activity areas for multi-family developments comply with the outdoor noise level standard, the standard will not be applied at patios or decks of individual units provided noise-reducing measures are incorporated (e.g., orientation of patio/deck, screening of patio with masonry or other noise-attenuating material). Outdoor activity areas for non-residential developments are the common areas where people generally congregate, including pedestrian plazas, seating areas, and outside lunch facilities; not all residential developments include outdoor activity areas.
3. In areas where it is not possible to reduce exterior noise levels to achieve the outdoor activity area standard using a practical application of the best noise-reduction technology, an increase of up to 5 dB Ldn over the standard will be allowed provided that available exterior noise reduction measures have been implemented and interior noise levels are in compliance with this table.

LAND USE[1]	OUTDOOR ACTIVITY AREAS[2,3]	INTERIOR SPACES	
		L_{DN}/CNEL, DB	L_{EQ}, DB[4]
4. Determined for a typical worst-case hour during periods of use.			

SOURCE: CITY OF LATHROP GENERAL PLAN, NOISE ELEMENT, TABLE N-2.

TABLE 3.11-6: STATIONARY SOURCE NOISE STANDARDS (TABLE N-3 OF LATHROP GENERAL PLAN)

NOISE LEVEL DESCRIPTOR	DAYTIME 7AM TO 10PM	NIGHTTIME 10PM TO 7AM
Hourly L_{eg}, dB	55	45

1. Each of the noise levels specified above should be lowered by 5 dB for simple noise tones, noises consisting primarily of speech or music, or recurring impulsive noises. Such noises are generally considered to be particularly annoying and are a primary source of noise complaints.
2. No standards have been included for interior noise levels. Standard construction practices should, with the exterior noise levels identified, result in acceptable interior noise levels.
3. Stationary noise sources which are typically of concern include, but are not limited to, the following:
    a. HVAC Systems
    b. Pump Stations
    c. Emergency Generators
    d. Steam Valves
    e. Generators
    f. Air Compressors
    g. Conveyor Systems
    h. Pile Drivers
    i. Drill Rigs
    j. Welders
    k. Outdoor Speaker
    l. Cooling Towers/Evaporative Condensers
    m. Lift Stations
    n. Boilers
    o. Steam Turbines
    p. Fans
    q. Heavy Equipment
    r. Transformers
    s. Grinders
    t. Gas or Diesel Motors
    u. Cutting Equipment
    v. Blowers
4. The types of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities, pump stations, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.

SOURCE: CITY OF LATHROP GENERAL PLAN, NOISE ELEMENT, TABLE N-3.

Policy N-1.2. Noise Mitigation. Require new development to mitigate excessive noise to the standards indicated in Tables N-1 [Table 3.11-4], N-2 [Table 3.11-5], and N-3 [Table

3.11-6] through best practices, including building location and orientation, building design features, placement of noise-generating equipment away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant features between noise sources and sensitive receptors, and use of noise-minimizing materials.

Policy N-1.3. Indoor Residential Noise Level. Ensure that new development does not result in indoor noise levels exceeding 45 dBA L_{dn} for residential uses by requiring the implementation of construction techniques and noise reduction measures for all new residential development.

Policy N-1.4. Acoustical Studies. Require acoustical studies for new discretionary developments and transportation improvements that have the potential to affect existing noise-sensitive uses such as schools, hospitals, libraries, care facilities, and residential areas; and for projects that would introduce new noise-sensitive uses into an area where existing noise levels may exceed the thresholds identified in this element. For projects that are required to prepare an acoustical study, the following stationary and transportation noise source criteria shall be used to determine the significance of those impacts.

A. Stationary and Non-Transportation Noise Sources - A significant impact will occur if the project results in an exceedance of the noise level standards contained in this element, or the project will result in an increase in ambient noise levels by more than 3 dB, whichever is greater.

B. Transportation Noise Sources -

1. Where existing traffic noise levels are less than 60 dB Ldn at the outdoor activity areas of noise-sensitive uses, a +5 dB Ldn increase in roadway noise levels will be considered significant;

2. Where existing traffic noise levels range between 60 and 65 dB Ldn at the outdoor activity areas of noise-sensitive uses, a +3 dB Ldn increase in roadway noise levels will be considered significant; and

3. Where existing traffic noise levels are greater than 65 dB Ldn at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB Ldn increase in roadway noise levels will be considered significant.

Policy N-1.5. Acoustical Studies. For projects that are required to prepare an acoustical analysis, the analysis shall:

A. Be the responsibility of the applicant.

B. Be prepared by a qualified acoustical consultant experienced in the fields of environmental noise assessment and architectural acoustics.

C. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources.

D. Estimate existing and projected (20 years) noise levels in terms of the standards of Tables N-1, N-2, or N-3, and compare those levels to the adopted policies of the Noise Element.

E. Recommend appropriate mitigation measures to achieve compliance with the adopted policies and standards of the Noise Element.

F. Estimate noise exposure after the prescribed mitigation measures have been implemented.

G. If necessary, describe a post-project assessment program to monitor the effectiveness of the proposed mitigation measures.

City of Lathrop Municipal Code

The City of Lathrop Noise Ordinance sets limits for community noise exposure, similar to those outlined above in the General Plan Noise Element. The Noise Ordinance standards are contained in Section 8.20.040 of the Lathrop Municipal Code. Construction activities are exempt from these regulations, when conducted according to Section 8.20.110, as outlined below.

Where the ambient noise level is less than designated in this section the respective noise level in this section shall govern:

TABLE 3.11-7: CITY OF LATHROP NOISE ORDINANCE

ZONE	*TIME*	*VERY QUIET (RURAL, SUBURBAN)*	*SLIGHTLY QUIET (SUBURBAN, URBAN)*	*NOISY (URBAN)*
Residential, low	10 p.m. to 7 a.m.	40	45	50
	7 p.m. to 10 p.m.	45	50	55
	7 a.m. to 7 p.m.	50	55	60
Residential, multifamily	10 p.m. to 7 a.m.	45	50	55
	7 a.m. to 10 p.m.	50	55	60
Commercial	10 p.m. to 7 a.m.	50	55	60
	7 a.m. to 10 p.m.	55	60	65
Limited Industrial	Anytime	70	70	70
General Industrial	Anytime	75	75	75

SOURCE: LATHROP, CALIFORNIA CODE OF ORDINANCES, TITLE 8: HEALTH AND SAFETY, CHAPTER 8.20: NOISE.

8.20.110 CONSTRUCTION OF BUILDINGS AND PROJECTS

It shall be unlawful for any person within a residential zone or within a radius of five hundred (500) feet therefrom, to operate equipment or perform any outside construction or repair work on buildings, structures or projects or to operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or any other construction type device between the hours of ten p.m. of one day and seven a.m. of the next day, or eleven p.m. and nine a.m. Fridays, Saturdays and legal holidays, in such a manner that a reasonable person of normal sensitiveness residing in the area is caused discomfort or annoyance unless beforehand a permit therefore has been duly obtained from the office or body of the city having the function to issue permits of this kind. No permit shall be required to perform emergency work as defined in Sections 8.20.010 through 8.20.040. (Prior code § 99.40)

VIBRATION STANDARDS

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

The City of Lathrop does not have specific policies pertaining to vibration levels. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 3.11-8 indicates that the threshold for damage to structures ranges from 0.2 to 0.6 peak particle velocity in inches per second (in/sec p.p.v). A threshold of 0.20 in/sec p.p.v. is considered to be a reasonable threshold for short-term construction projects.

TABLE 3.11-8: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS

Peak Particle Velocity		*Human Reaction*	*Effect on Buildings*
mm/sec.	*in./sec.*		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected

PEAK PARTICLE VELOCITY		HUMAN REACTION	EFFECT ON BUILDINGS
MM/SEC.	IN./SEC.		
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage.

SOURCE: CALTRANS. TRANSPORTATION RELATED EARTHBORN VIBRATIONS. TAV-02-01-R9601 FEBRUARY 20, 2002.

3.11.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines and case law, the Project will have a significant impact related to noise if it will result in:

- A substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels; or
- For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the Project area to excessive noise levels.

The Project Area is not located within two miles of a public or private airport or airstrip. The nearest regional public use airport is the Stockton Metropolitan Airport, located approximately six miles to the northeast, in the city of Stockton. Therefore, airports and airport noise are not discussed further in this analysis.

Determination of a Significant Increase in Noise Levels

TEMPORARY CONSTRUCTION NOISE IMPACTS

With temporary noise impacts (construction), identification of "substantial increases" depends upon the duration of the impact, the temporal daily nature of the impact, and the absolute change in decibel levels. The City has not adopted any formal standard for evaluating temporary construction noise which occurs within allowable hours. For short-term noise associated with Project construction, Saxelby Acoustics recommends use of the Caltrans increase criteria of 12 dBA (Caltrans Traffic Noise Protocol, 2020), applied to existing residential receptors in the Project vicinity. This level of increase is approximately equivalent to a doubling of sound energy and has been the standard of significance for Caltrans projects at the State level for many years. Application of this standard to construction activities is considered reasonable considering the temporary nature of construction activities.

OPERATIONAL IMPACTS

The City of Lathrop establishes criteria for determination of significant noise impacts due to stationary and non-transportation noise sources in Policy N-1.4A. The policy states that a significant impact will occur if the project results in an exceedance of the noise level standards contained in the General Plan or if the project will result in an increase in ambient noise levels by more than 3 dB.

The City of Lathrop establishes criteria for determination of significant noise impacts due to transportation noise sources in Policy N-1.4B. The policy states that where existing transportation noise levels are greater than 65 dBA L_{dn}, at the outdoor activity areas of noise-sensitive uses, a +1.5 dBA L_{dn} increase in roadway noise levels will be considered significant. Where transportation noise levels are between 60 dBA L_{dn} and 65 dBA L_{dn}, a +3.0 dB L_{dn} increase in roadway noise levels will be considered significant. Where transportation noise levels are less than 60 dBA L_{dn}, a +5.0 dB L_{dn} increase in roadway noise levels will be considered significant.

IMPACTS AND MITIGATION MEASURES

Impact 3.11-1: The Project, with mitigation, would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. (Less Than Significant with Mitigation)

TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS WITH AND WITHOUT THE PROJECT

Based upon the City of Lathrop General Plan, where existing traffic noise levels are greater than 65 dBA L_{dn}, at the outdoor activity areas of noise-sensitive uses, a +1.5 dBA L_{dn} increase in roadway noise levels will be considered significant. Where traffic noise levels are between 60 dBA L_{dn} and 65 dBA L_{dn}, a +3.0 dB L_{dn} increase in roadway noise levels will be considered significant. Where traffic noise levels are less than 60 dBA L_{dn}, a +5.0 dB L_{dn} increase in roadway noise levels will be considered significant. Tables 3.11-9, 3.11-10, and 3.11-11 provide an assessment of significance for each roadway segment in the Project vicinity in the existing, existing plus project, baseline, baseline plus project, cumulative, and cumulative plus project.

TABLE 3.11-9: EXISTING PLUS PROJECT TRAFFIC NOISE INCREASE SIGNIFICANCE ANALYSIS

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, DB) AT NEAREST SENSITIVE RECEPTORS				
		EXISTING	EXISTING + PROJECT	CHANGE	CRITERIA	SIGNIFICANT?
Golden Valley Pkwy	South of Spartan Way	62.7	62.8	0.1	+3 dB	No
Lathrop Road	North of Barbara Terry Blvd	49.7	52.6	2.9	>60 or +5.0 dB	No
Louise Avenue	East of I-5	66.4	66.5	0.1	+1.5 dB	No
McKee Blvd	West of Barbara Terry Blvd	51.6	51.9	0.3	>60 or +5.0 dB	No
River Islands Pkwy	West of Golden Valley Pkwy	62.6	63.7	1.1	+3 dB	No
River Islands Pkwy	West of McKee Blvd	57.5	59.1	1.6	>60 or +5.0 dB	No
River Islands Pkwy	West of Project Steet C	55.2	55.6	0.4	>60 or +5.0 dB	No
Spartan Way	West of Golden Valley Pkwy	58.6	58.8	0.2	>60 or +5.0 dB	No

SOURCE : SAXELBY ACOUSTICS. 2024.

TABLE 3.11-10: BASELINE PLUS PROJECT TRAFFIC NOISE INCREASE SIGNIFICANCE ANALYSIS

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, DB) AT NEAREST SENSITIVE RECEPTORS				
		BASELINE	BASELINE + PROJECT	CHANGE	CRITERIA	SIGNIFICANT?
Golden Valley Pkwy	South of Spartan Way	63.3	63.4	0.1	+3 dB	No
Lathrop Road	North of Barbara Terry Blvd	49.9	52.7	2.8	>60 or +5.0 dB	No
Louise Avenue	East of I-5	67.4	67.6	0.2	+1.5 dB	No
McKee Blvd	West of Barbara Terry Blvd	51.6	51.9	0.3	>60 or +5.0 dB	No
River Islands Pkwy	West of Golden Valley Pkwy	65.2	65.8	0.6	+1.5 dB	No
River Islands Pkwy	West of McKee Blvd	60.9	61.7	0.8	+3 dB	No
River Islands Pkwy	West of Project Steet C	58.3	58.4	0.1	>60 or +5.0 dB	No
Spartan Way	West of Golden Valley Pkwy	59.7	59.9	0.2	>60 or +5.0 dB	No

SOURCE : SAXELBY ACOUSTICS. 2024.

TABLE 3.11-11: CUMULATIVE PLUS PROJECT TRAFFIC NOISE INCREASE SIGNIFICANCE ANALYSIS

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, DB) AT NEAREST SENSITIVE RECEPTORS				
		CUMULATIVE	CUMULATIVE + PROJECT	CHANGE	CRITERIA	SIGNIFICANT?
Golden Valley Pkwy	South of Spartan Way	64.3	64.4	0.1	+3 dB	No
Lathrop Road	North of Barbara Terry Blvd	50.9	53.3	2.4	>60 or +5.0 dB	No
Louise Avenue	East of I-5	58.5	58.6	0.1	+1.5 dB	No
McKee Blvd	West of Barbara Terry Blvd	52.6	52.8	0.2	>60 or +5.0 dB	No
River Islands Pkwy	West of Golden Valley Pkwy	66.4	66.9	0.5	+1.5 dB	No
River Islands Pkwy	West of McKee Blvd	62.0	62.7	0.7	+3 dB	No
River Islands Pkwy	West of Project Steet C	59.4	59.6	0.2	>60 or +5.0 dB	No
Spartan Way	West of Golden Valley Pkwy	60.8	60.9	0.1	>60 or +5.0 dB	No

SOURCE : SAXELBY ACOUSTICS. 2024.

As shown in Tables 3.11-9, 3.11-10 and 3.11-11, increases in traffic on the local roadway network are not predicted to cause significant increases in noise levels. Therefore, traffic noise impacts would be ***less-than-significant.***

PROJECT-GENERATED NON-TRANSPORTATION NOISE ENVIRONMENT AT OFF-SITE RECEPTORS

The proposed Project would include typical residential noise which would be compatible with the existing adjacent residential uses.

This is a ***less-than-significant*** impact, and no mitigation is required.

CONSTRUCTION NOISE

During the construction phases of the Project, noise from construction activities would add to the noise environment in the immediate Project vicinity. As indicated in Table 3.11-12, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet. Construction activities would also be temporary in nature and are anticipated to occur during normal daytime working hours.

TABLE 3.11-12: CONSTRUCTION EQUIPMENT NOISE

TYPE OF EQUIPMENT	*MAXIMUM LEVEL, DB AT 50 FEET*
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

SOURCE: ROADWAY CONSTRUCTION NOISE MODEL USER'S GUIDE. FEDERAL HIGHWAY ADMINISTRATION. FHWA-HEP-05-054. JANUARY 2006.

The City of Lathrop Municipal Code establishes acceptable hours of construction as between 7:00 a.m. and 10:00 p.m. Sunday through Thursday and between 9:00 a.m. and 11:00 p.m. on Friday, Saturday, and legal holidays.

Caltrans defines a significant increase due to noise as an increase of 12 dBA over existing ambient noise levels; Saxelby Acoustics used this criterion to evaluate increases due to construction noise associated with the Project. As shown in Table 3.11-12, construction equipment is predicted to generate noise levels of up to 90 dBA L_{max} at 50 feet. Construction noise is evaluated as occurring at the center of the site to represent average noise levels generated over the duration of construction across the Project site. Table 3.11-13 provides the predicted noise levels at the nearest sensitive receptor to each Project area.

TABLE 3.11-13: CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTORS

PHASE	*DISTANCE TO SENSITIVE RECEPTORS*[1]	*REPRESENTATIVE NOISE RECEPTOR*	*EXISTING MAX*[2]	*CONSTRUCTION MAX*	*INCREASE OVER AMBIENT*	*EXCEEDS 12 DB?*
1	80	LT-1	80[3]	86	6	No
2	680	LT-1	80[3]	67	0	No
3	525	LT-2	66	65[4]	0	No
4	1160	LT-2	66	63	0	No
5	1940	LT-2	66	58	0	No
6	1220	LT-2	66	62	0	No

NOTES:
[1]AS MEASURED FROM THE CENTER OF CONSTRUCTION AREA.
[2]BASED UPON LOWEST AVERAGE DAYTIME MAXIMUM NOISE LEVEL MEASURED.
[3]A -5 DB CORRECTION WAS APPLIED TO ACCOUNT FOR EXISTING SOUND WALL SHIELDING EXISTING SENSITIVE RECEPTORS.
[4]A -5 DB CORRECTION WAS APPLIED TO ACCOUNT FOR EXISTING SOUND WALL SHIELDING PROPOSED RESIDENCES FROM PHASE 3 CONSTRUCTION AREA.
SOURCE: SAXELBY ACOUSTICS. 2024.

As shown in Table 3.11-13, the maximum increase over ambient due to construction noise is 6 dB. Therefore, Project construction would not cause an increase of greater than 12 dB at the nearby sensitive receptors.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from the construction site. This noise increase would be of short duration and would occur during daytime hours.

Although construction activities are temporary in nature and would occur during normal daytime working hours, construction-related noise could result in sleep interference at existing noise-sensitive land uses in the vicinity of the construction if construction activities were to occur outside the normal daytime hours. Therefore, impacts resulting from noise levels temporarily exceeding the threshold of significance due to construction would be considered ***potentially significant***.

MITIGATION MEASURE(S)

Mitigation Measure 3.11-1: *The following measures shall be implemented during construction of the Project:*

- *Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the hours of 7:00 a.m. and 10:00 p.m. Sunday through Thursday and between 9:00 a.m. and 11:00 p.m. on Friday, Saturday, and legal holidays.*

- *Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.*
- *When not in use, motorized construction equipment shall not be left idling for more than 5 minutes.*
- *Stationary equipment (power generators, compressors, etc.) shall be located at the farthest practical distance from nearby noise-sensitive land uses or sufficiently shielded to reduce noise-related impacts.*

These requirements shall be noted in the improvements plans prior to approval by the City's Public Works Department.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Less than Significant.

Mitigation Measure 3.11-1 requires that construction activities are limited to certain hours, construction equipment is properly maintained, equipment idling is limited, and stationary equipment is located away from noise-sensitive uses. Implementation of Mitigation Measure 3.11-1 would ensure this impact is less-than-significant by ensuring construction-related noise levels do not exceed ambient noise plus 12 dBA.

Impact 3.11-2: The Project would not generate excessive groundborne vibration or groundborne noise levels. (Less than Significant)

The primary vibration-generating activities associated with the proposed Project would occur during construction when activities such as grading, utilities placement and road construction occur. Table 3.11-14 shows the typical vibration levels produced by construction placement.

TABLE 3.11-14: VIBRATION LEVELS FOR VARIOUS CONSTRUCTION EQUIPMENT

TYPE OF EQUIPMENT	*PEAK PARTICLE VELOCITY @ 25 FEET (INCHES/SECOND)*	*PEAK PARTICLE VELOCITY @ 50 FEET (INCHES/SECOND)*	*PEAK PARTICLE VELOCITY @ 100 FEET (INCHES/SECOND)*
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210	0.074	0.026

SOURCE: FEDERAL TRANSIT ADMINISTRATION, TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT GUIDELINES, MAY 2006

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural damage.

As shown in Table 3.11-3**,** construction vibration levels anticipated for the Project are less than the 0.2 in/sec threshold at distances of 26 feet. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located approximately 26 feet, or further, from typical construction activities. At these distances, construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours. This is a ***less-than-significan*****t** impact and no mitigation is required.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required

This page left intentionally blank.

Legend

Mossdale West Project Area (225.86 acres)

Project Boundary/Development Area (167.42 acres)

Lathrop City Limits

Long-Term Noise Measurement Site

Short-Term Noise Measurement Site

Sources: Saxelby Acoustics, 3/25/2024; San Joaquin County GIS; MAXAR Imagery 8/7/2023. Map date: May 12, 2024.

LATHROP MOSSDALE WEST

Figure 3.11-1. Noise Measurement Sites

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

Public services such as fire and police protection are vital to maintaining a safe and healthy community. Educational services serve as a foundation for providing citizens with the skills and resources to excel today and in the future. There are many other public services that are important to a community, such as parks and recreational opportunities, libraries, museums, hospitals, and other healthcare facilities. This section provides a background discussion and analysis of fire protection services, police services, schools, parks and recreational facilities, libraries, and other community facilities and services. This section is organized with an existing setting, regulatory setting, and impact analysis.

The information in this section is primarily derived from the City of Lathrop General Plan (City of Lathrop, 2022), the Draft Environmental Impact Report for the Lathrop General Plan Update (City of Lathrop, 2022), and the Lathrop Municipal Services Review and Sphere of Influence Plan (City of Lathrop, 2022).

Utilities services, including water, sewer, stormwater and drainage, and solid waste disposal, are addressed in Chapter 3.14 (Utilities and Service Systems) of this Draft EIR.

There were no comments received during the NOP comment period that specifically address public services or recreation. Full comments received are included in Appendix A.

3.12.1 ENVIRONMENTAL SETTING

Governmental Agencies receive funds for the provision of public services through development fees, property taxes, and connection and usage fees. As land is developed within the City and annexed into the City of Lathrop, these fees apply. The City of Lathrop, and other service providers, review these fee structures on an annual basis to ensure that they provide adequate financing to cover the provision of services. The service provider is responsible for continual oversight to ensure that the fee structures are adequate, and that they are collected prior to development. The service provider reviews the referenced fees and user charges on an annual basis to determine the correct level of adjustment required to reverse any deficits and assure funding for needed infrastructure going forward.

POLICE SERVICES

The Lathrop Police Department, located at 940 River Islands Parkway, was created in 2021 in order to transition law enforcement services from the San Joaquin County Sheriff to the City. The new Lathrop Police Department identifies 46 new sworn and non-sworn positions and on May 10, 2021, the City approved a Master Consulting Services Agreement with CPS HR Consulting (CPS) to begin recruitment of personnel for the new City of Lathrop Police Department and authorized the creation of a new Police Chief Position. The City continues to recruit for the various levels of staffing, purchase necessary equipment, such as Police vehicles, and coordination with other jurisdictions for the purpose of evidence storage and 911 operations. Located at 940 River Islands Parkway, the new Lathrop Police Department initiated operations on June 29, 2022.[1]

The Lathrop Police Department is staffed 24 hours per day in a series of five patrol teams, staffed by a Sergeant and up to five Police Officers.[2] The Lathrop Police Department has 35 sworn officers including two Police Captains, six Sergeants, and 26 Police Officers. The Lathrop Police Department also has 12 Professional Staff, including one Executive Assistant, one Records Supervisor, two Records Assistants, one Management Analyst, one Property/Evidence Technician, one Community Services Supervisor and Community Services Officers. If needed, additional assistance can be summoned under a mutual aid agreement with surrounding cities and the County. Existing police staffing levels in the City are approximately 1.22 officers per 1,000 residents. The current City Wide Priority 1 average response time is four minutes.[3]

The approval and/or pending development projects in the City will result in additional demand for law enforcement services. Capital costs for new facilities and equipment is funded through development impact fees and operational costs are funded through a combination of an increased tax base, participation in Community Facility District (CFD) and Measure C funding (A City initiated special tax which does not have a sunset clause).

Approved and pending development projects in the City will result in additional demand for law enforcement services. Capital costs for new facilities and equipment would be funded through development impact fees, and operating costs would be funded through a combination of an increased tax base and the annexation to a new community facility district (CFD) or formation of a new CFD.

Table 3.12-1 shows the recent crime statistics for the City of Lathrop in 2022.

---

[1] City of Lathrop Police Department, Lathrop Police Department Transition History. Available at: https://www.ci.lathrop.ca.us/police/page/lathrop-police-department-transition-history. Accessed April 2024.

[2] City of Lathrop, Municipal Services Review and Sphere of Influence Amendment, Accountability for Community Service Needs, Law Enforcement. July 2022. Available at: https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/community_development/page/25422/lathrop_msr_final_draft_july_2022_final_07.22.22.pdf. Accessed April 2024.

[3] City of Lathrop Police Department, New Lathrop Police Department June 2022 Update. Available at: https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/police/page/141/new_lathrop_police_department_update_june_2022.pdf. Accessed April 2024.

TABLE 3.12-1: LATHROP POLICE DEPARTMENT CRIME STATISTICS (2022)

CATEGORY/CRIME	*2022*
Total Violent Crimes	50
Homicide	1
Rape	1
Robbery	6
Assault	34
Total Property Crimes	287
Burglary	40
Motor Vehicle Theft	36
Larceny	208
Arson	3

SOURCE: FEDERAL BUREAU OF INVESTIGATION, CRIME DATA REPORTER, CITY OF LATHROP, 2024. AVAILABLE AT: HTTPS://CDE.UCR.CJIS.GOV/LATEST/WEBAPP/#/PAGES/EXPLORER/CRIME/CRIME-TREND. ACCESSED APRIL 2024.

FIRE SERVICES

The Lathrop Planning Area is covered by two independent Fire Protection Districts, the Lathrop-Manteca Fire Protection District (LMFD) and French Camp-McKinley Fire District (French Camp). The LMFD provides fire protection services for all lands within the City of Lathrop, including lands south of Roth Road in addition to providing service to some 84.7 square miles of rural area around Lathrop and Manteca (in the southern San Joaquin County area).

LMFD was established in 1936 to provide fire protection for the township of Lathrop, rural Lathrop and the rural areas surrounding Manteca. The Fire District was organized under the laws of the State of California, Health and Safety Code Section 13800, known as the Fire Protection District law of 1987. LMFD is governed by a five-member Board of Directors who are elected at-large to serve a four-year term.[4] Since 1936, LMFD has developed into a pro-active Fire Department covering 100 square miles including the City of Lathrop. LMFD is organized to maintain career personnel on duty, 24 hours a day, year-round, to respond to emergencies from the fire stations. LMFD has three Fire Stations located in the City of Lathrop.

Similar to LMFD, the French Camp McKinley Fire District (FCFD) was also organized under California Health and Safety Code Section 13800. FCFD was originally formed in 1946 and is currently governed by a five-member elected Board of Directors with staggered four-year terms. FCFD provides fire and life safety services to approximately 24 square miles of unincorporated San Joaquin County and also

[4] Lathrop-Manteca Fire Protection District, Administration. Available at: https://www.lmfire.org/administration. Accessed April 2024.

assists with protecting approximately 90 square miles of San Joaquin County's "Unprotected Area." FCFD is bordered by the City of Lathrop to the south and the City of Stockton to the north.[5]

LATHROP-MANTECA FIRE PROTECTION DISTRICT

Since the incorporation of Lathrop in 1989, the LMFD has worked with the City Council to develop plans to provide adequate coverage for potential urban growth of the city. This has included the imposition of Fire Facilities Fees for new development as well as a sharing in the Special Sales Tax (Measure C) passed City-wide.

The LMFD-wide fire suppression force is organized into three shifts consisting of 13 members each. Each of the shifts is on duty for rotating periods of 24 hours. A minimum of three full time firefighters are on duty at the satellite fire stations at all times. Each of the fire stations within the City of Lathrop, J Street (Station 31), Mossdale (Station 34), and River Islands (Station 35), have three full time firefighters assigned to each station, 24 hours per day, seven days per week. Additionally, one Battalion Chief is assigned to a station within the City to manage the day-to-day operations and provide scene management for emergency operations. Station 35 also includes the Fire Chief, administrative services, and Fire Prevention staff.

Per the LMFD 2018 Master Plan, the next planned Stations will be located as follows:[6]

- South Lathrop near the Yosemite Avenue and McKinley Avenue Corridor (Station 36);
- Kio Road, north of Lathrop City limits (Station 37); and
- River Islands Parkway, within the Phase 2 development area (Station 38).

The LMFD District boundaries spread over about 100 square miles, with the bulk of the District's population (70 percent) within the City limits of Lathrop.

In 2014, the LMFD switched dispatch providers. LMFD calls are now being dispatched by the City of Stockton along with the Manteca Fire Department, Stockton Fire Department, South County Fire Authority (Tracy) and Lodi Fire Departments. LMFD tracks the following times segments and continuously works to improve response times. These times are provided from LMFD's records, specific to the City of Lathrop's capturing data from January 1, 2020, to December 31, 2020.

> **Alarm Processing Time:** Defined as the time elapsed between receipt of alarm and the dispatch of apparatus to the emergency call. The LMFD benchmarks this according to the

[5] French Camp McKinley Fire District, Our District. Available at: https://www.frenchcampfire.com/our-district. Accessed April 2024.

[6] Lathrop Manteca Fire Protection District, 2018 General Master Plan Information and Fire Department Standards. Available at: https://www.lmfire.org/sites/default/files/fileattachments/administration/page/4411/master_plan_2018.pdf. Accessed April 2024.

National Fire Protection Association Standard 1221: Installation, Maintenance, and Use of Emergency Services Communications Systems. Section 7.4.3 of this standard identifies the that elapsed alarm processing for the highest priority of life-threatening calls shall have an alarm, processing time of 60 seconds for at least 90 percent of these total calls. The Lathrop Manteca Fire District currently contracts with the City of Stockton for dispatch services. In addition, the Fire District has moved its primary alerting system to an internet protocol system that increases the speed of which alarms are "pushed" to the emergency responding units. The Fire District meets this standard 100 percent of the time.

Turnout Time: This time is calculated from the receipt of the alarm by the station of unit and ends at the time the unit begins its rolling travel time. Benchmarks for these time standards are 60 seconds for 90 percent of the total Emergency Medical Calls and 80 seconds for 90 percent of the total Fire Calls. LMFD's data shows a 60 second turnout time for EMS Calls for 88 percent of occurrences and have an 80 second turnout time for 95 percent of the fire occurrences.

Response Time: Response time is reflected by the turnout time and travel time that are added together to create a complete picture of the Fire District response time. In 2020, the Fire District responded to emergency incidents 70 percent of the time within five minutes at the 90th percentile with all combined responses. It should be noted that due to growth demands and development planning the fire district responds to areas of new development that are often outside of the existing service zones. While call volumes in those areas are generally lower, they do have an impact on the overall analyses. LMFD has plans to add two to three additional fire stations/companies in order to service these developments. At buildout, LMFD expects to be closely meeting travel distance times that are closer in alignment with LMFD standards.

The Fire Marshal administers LMFD’s fire prevention and code enforcement program. Plan checks are done by the Fire Marshal along with the more complex inspections. Fire Company personnel conduct inspections and annual re-inspections. Additional fire safety programs include smoke detector installation for the elderly and disabled and fire safety and awareness in the schools.

LMFD responds not only to fires of all types, but also medical emergencies, traffic accidents, and river rescues. LMFD is an active member of the San Joaquin County Hazardous Materials Response Team and is also part of the Urban Search and Rescue Team.

ISO RATING

The Insurance Services Office (ISO) rating measures individual fire protection agencies against a national Fire Suppression Rating Schedule which includes such criteria as facilities and support for handling and dispatching fire alarms, first-alarm responses and initial attack, and adequacy of the local water supply for the fire suppression purposes. ISO ratings are on a scale of one to ten, with one being the highest rating. In 2013, ISO developed split classifications for some communities, which can represent the risk of loss more precisely. An example of a split classification system is 4/4X or 4/4Y. The first number refers to the classification of properties within five road miles of a fire station and within 1,000 feet of a creditable water supply. The second number, with either the X or Y designation, applies to properties within five road miles of a fire station but beyond 1,000 feet of a creditable water supply. ISO generally assigned Class 10 to properties beyond five road miles.

LATHROP-MANTECA FIRE PROTECTION DISTRICT

In its most recent report, the ISO Public Classification Program rates the LMFD as a community classification of 3 for the City of Lathrop,[7] This rating is unchanged since the ISO rating for the City of Lathrop in their January 2013 ISO report.

FIRE STATIONS

LMFD currently operates three fire stations within the Lathrop Planning area, listed below.

- **Station 31 (800 E. J Street, Lathrop, CA 95330):** Station 31 acts as the headquarters station for the District, and services a large section of East Lathrop. The boundaries generally run from Interstate 5 at Roth Road to Louise Avenue. Station 31 is staffed with four personnel, with the 4th Firefighter/Engineer used as a vacation relief.
- **Station 34 (460 River Islands Parkway, Lathrop, CA 95330)**: Station 34 is located on the west side of Interstate 5 within the City of Lathrop. This station responds to calls for service on the west side of Interstate 5 and south of Louise Avenue. Staffing for this station includes one Captain and one Firefighter/Engineer.
- **Station 35 (19001 Somerston, Lathrop, CA 95330)**: Station 35 is located in the southern portion of Lathrop west of Interstate 5. The primary response area for Station 35 is the River Islands development in the southwestern portion of the City of Lathrop. Station 35 houses one of the LMFD's Type 3 (wildland) fire engines and the LMFD rescue unit.

As noted above, per the LMFD 2018 Master Plan, the next planned stations will be located as follows:

- South Lathrop near the Yosemite Avenue and McKinley Avenue Corridor (**Station 36**);
- Kio Road, north of Lathrop City limits (**Station 37**); and
- River Islands Parkway, within the Phase 2 development area (**Station 38**).

PARKS AND RECREATION

The City of Lathrop Parks and Recreation Department manages 108 acres of parks and open space throughout the City of Lathrop. Local parks offer amenities such as a community center with a gymnasium, open space, athletic fields, playgrounds, and picnic areas. The Parks and Recreation Department manages programs that are multi-generation in nature such as community events, sports camps, adult and youth sports programs, youth before and after school programs, art programs, and senior programs.

[7] City of Lathrop General Plan Draft EIR, 2022

Types of Parks

COMMUNITY PARKS

Community parks are typically up to 20 acres in size and include areas for active sports as well as space for family and group activities. Community parks are larger than neighborhood parks and provide services to fulfill the active and passive recreational needs of multiple neighborhoods. Community parks serve the needs of a local neighborhood by providing a close to home site for more active recreation that is not typically suitable or physically possible in a neighborhood park such as formal sports fields or lighted courts.

The City of Lathrop has four community parks totaling 47 acres. The facilities included in these parks are fields and courts for various sports, a large swimming pool, a community center building for arts and crafts, clubs, and social activities. Some of the community center buildings are joint-use facilities with the school district.

NEIGHBORHOOD PARKS

Neighborhood parks are typically a minimum of four acres in size and serve as the focal point of the community providing the hub for both physical and social activities. Neighborhood parks should be designed to be flexible to serve a variety of seasonal recreation needs. These parks act as critical building blocks of the City's image and assist in developing an overall sense of community and security. They also serve as essential access points for the City-wide green space network.

Currently, Lathrop has ten neighborhood parks accounting for 42.6 acres.

MINI PARKS

Mini parks are generally less than two acres in size and provide residents with a social and recreational gathering place, similar to a neighborhood park, but on a smaller scale. Mini-parks should provide small-scale recreational and aesthetic benefits primarily in denser residential areas or commercial areas with high pedestrian use. Each resident should be within walking distance (one half mile) of a neighborhood or mini park.

Currently, Lathrop has eight mini parks totaling 7.6 acres.

OPEN SPACE CORRIDORS

The Open Space Corridor can take several forms, including the pedestrian parkway separate from auto traffic, a combined vehicle and pedestrian parkway, a buffer zone between residential and commercial or industrial areas, or as a lineal park or paseo connecting with other components of the Parks and Recreation system or located separate from other areas such as along reaches of the San Joaquin River or other waterways.

River Park North and South have been included in this classification, putting Lathrop at (2) two linear parks, accounting for 10.7 acres.

City Parks

The City currently manages 25 distinct parks and four public facilities. Table 3.12-1 summarizes the City's park facilities. Additional parks within the City of Lathrop will become available in the City of Lathrop as development continues within the River Islands development area.

TABLE 3.12-1: SUMMARY OF PARKS AND RECREATION FACILITIES

PARK/FACILITY NAME	*FACILITY TYPE*	*ACREAGE*
Apolinar Sangalang Park	Community Park	9.7
Armstrong Park	Mini Park	0.4
Basin Park	Neighborhood Park	4.4
Crescent Park	Mini Park	1.4
Crystal Cove Park	Neighborhood Park	3.3
Generations Center	Community Park	6.0
Lathrop Skate Park	Mini Park	0.3
Leland & Jane Stanford Park	Neighborhood Park	4.1
Libby Park	Mini Park	1.2
Michael Vega Park	Neighborhood Park	2.9
Milestone Manor Park	Mini Park	1.00
Mossdale Commons	Mini Park	1.45
Mossdale Landing Community Park	Community Park	20.4
Park West	Neighborhood Park	6.8
Reflections Park	Neighborhood Park	5.2
River Park North	Open Space Corridor	3.2
River Park South	Open Space Corridor	7.4
Somerston Park	Neighborhood Park	2.0
Summer House Park	Neighborhood Park	2.0
The Green	Mini Park	1.0
Thomsen Park	Mini Park	0.8
Tidewater Park	Neighborhood Park	2.1
Valverde Park	Community Park	9.1
William S. Moss Park	Neighborhood Park	4.1
Woodfield Park	Neighborhood Park	5.5

SOURCE: CITY OF LATHROP DEPARTMENT OF PARKS AND RECREATION, FEBRUARY 2021 FIVE YEAR MASTER PLAN. AVAILABLE AT: HTTPS://WWW.CI.LATHROP.CA.US/SITES/DEFAULT/FILES/FILEATTACHMENTS/PARKS_AND_RECREATION/PAGE/6183/LATHROP_MASTER_PLAN_-_FINAL_-_2.9.COMPRESSED.PDF. ACCESSED APRIL 2024.

PARK STANDARDS

Lathrop has established the following standards for acres of parkland:

Five acres per 1,000 residents including:

- Two acres of neighborhood park for every 1,000 new residents
- Three acres of community park for every 1,000 new residents

As described in the Lathrop Parks and Recreation Master Plan (2021), Lathrop has approximately 108 acres of parks identified in the parks inventory and notes that to continue to meet the adopted standard of five acres per 1,000 residents (two acres of neighborhood park space and three acres of community park space), Lathrop is short approximately 0.1 acre of park for the current (2020) population. This does not consider 31 acres of planned and funded parks or 70 acres of future parks.[8]

On a regional scale, the City is located in the Sacramento-San Joaquin Delta (Delta), which contains several recreational areas and facilities, primarily for water-based recreation. Regional County parks near the City include the 9.85-acre Dos Reis Regional Park and the 3.7-acre Mossdale Crossing Regional Park, both located along the San Joaquin River. Mossdale Crossing Park is located on the west side of Interstate 5. Each of these parks includes boat launch ramps, picnic/barbeque areas, and children's play areas. Dos Reis Regional Park also has camping facilities. Also in the vicinity is the Haven Acres Marina, a private marina located on the San Joaquin River north of Dos Reis Regional Park. This facility provides river access to the San Joaquin River and includes parking areas, a boat ramp, and 10 boat berths.

SCHOOL SERVICES

Schools within the City of Lathrop are part of the Manteca Unified School District (MUSD) and the Banta Unified School District (BUSD). The MUSD provides school services for grades K through 12 within the communities of Manteca, Lathrop, Stockton, and French Camp. The MUSD area is approximately 113 square miles and serves more than 24,667 students. Within the City of Lathrop, there are three elementary schools (Lathrop Elementary School, Joseph Widmer School, and Mossdale Elementary School) and one high school (Lathrop High School). River Islands has one high school (that is currently under construction) and three charter elementary schools, located within the BUSD (River Islands Technology Academy, EPIC Academy and the S.T.E.A.M. Academy) and one high school (River Islands High School).

Table 3.12-3 lists MUSD and BUSD schools in Lathrop and enrollment for each school for the 2023-2024 school year.

As shown in Table 3.12-3, the schools in the City had a total enrollment of approximately 6,127 students, of which 4,593 were enrolled in elementary and middle school (grades K – 8) and 1,534 were enrolled in high school (grades 9 – 12).

Students generated by the proposed Project would attend MUSD schools. District-wide MUSD Schools has a total enrollment of 25,000 students for the 2023 to 2024 school year. Table 3.12-4 provides a summary of the public school enrollment by grade within MUSD.

---

[8] City of Lathrop Department of Parks and Recreation, February 2021 Five Year Master Plan. Available at: https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/parks_and_recreation/page/6183/lathrop_master_plan_-_final_-_2.9.compressed.pdf. Accessed April 2024.

TABLE 3.12-3: PUBLIC SCHOOLS SERVING LATHROP

SCHOOL	*GRADES SERVED*	*ADDRESS*	*ENROLLMENT 2023-24 SCHOOL YEAR*
ELEMENTARY AND MIDDLE SCHOOLS			
Lathrop Elementary School	K-8	15851 5th Street	935
Joseph Widmer Elementary School	K-8	751 Stonebridge Lane	911
Mossdale Elementary School	K-8	455 Brookhurst Boulevard	1,064
River Islands Technology Academy	K-8	1175 Marina Drive	975
Next Generation S.T.E.A.M. Academy	K-8	18001 Commercial Street	726
EPIC Academy	K-8	2760 Penrose Lane	805
Total			**4,611**
HIGH SCHOOLS			
Lathrop High School	9-12	647 Spartan Way	1,509
River Islands High School	9-12	16601 Riptide Way	278
Total			**1,509**

SOURCE: CALIFORNIA DEPARTMENT OF EDUCATION EDUCATIONAL DEMOGRAPHICS UNIT ENROLLMENT FOR 2023-24. AVAILABLE AT: HTTPS://DQ.CDE.CA.GOV/DATAQUEST/DQCENSUS/ENRAGEGRDLEVELS.ASPX?CDS=3968593&AGGLEVEL=DISTRICT&YEAR=2022-23&RO=Y. ACCESSED DECEMBER 2024.

TABLE 3.12-4: ENROLLMENT BY GRADE MUSD (2023-2024)

MUSD	*GRADE LEVEL*													
	TK AND K	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*TOTAL 2023-2024*
Total	2,119	1,705	1,825	1,890	1,861	1,801	1,906	1,945	1,936	1,867	2,012	1,970	2,163	**25,000**

SOURCE: CALIFORNIA DEPARTMENT OF EDUCATION EDUCATIONAL DEMOGRAPHICS UNIT ENROLLMENT FOR 2023-2024. AVAILABLE AT: HTTPS://DQ.CDE.CA.GOV/DATAQUEST/DQCENSUS/ENRAGEGRD.ASPX?CDS=3968593&AGGLEVEL=DISTRICT&YEAR=2022-23&RO=Y&RO=Y. ACCESSED DECEMBER 2024.

For the 2022 to 2023 school year, BUSD has a total enrollment of 3,022 students in grades K through 9. Table 3.12-5 provides a summary of the public school enrollment by grade within Banta Unified School District.

TABLE 3.12-5: ENROLLMENT BY GRADE BANTA UNIFIED SCHOOL DISTRICT (2023-2024)

BANTA	*GRADE LEVEL*										
	TK AND K	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*TOTAL 2023-2024*
Total	345	257	291	311	305	295	346	295	299	159	**119**	**3,022**

SOURCE: CALIFORNIA DEPARTMENT OF EDUCATION EDUCATIONAL DEMOGRAPHICS UNIT ENROLLMENT FOR 2022-2023. AVAILABLE AT: HTTPS://DQ.CDE.CA.GOV/DATAQUEST/DQCENSUS/ENRAGEGRD.ASPX?CDS=3977388&AGGLEVEL=DISTRICT&YEAR=2022-23&RO=Y. ACCESSED APRIL 2024.

OTHER AGENCY SERVICES

Library Services

The Lathrop Branch Library is located at 459 Spartan Way. The Lathrop Branch Library offers computer workstations for Internet and word processing use, a ready reference collection, and a circulating collection of popular materials in English and Spanish. Items include books, magazines, audiobooks, large print books, DVDs, and music CDs. The Manteca Bulletin is available for reading in the branch. Customers are able to receive hold requests, check out and return items, and to return materials from other library locations at this branch. The Lathrop Branch Library is open Monday through Thursday, from 1:00 to 6:00 PM, and Friday and Saturday from noon to 5:00 PM.

Lathrop Senior Center

The Lathrop Senior Center located at 15707 Fifth Street provides lunches, classes, and various trip sand activities. There are no membership fees to participate at the center’ however, some classes and activities have nominal fees. The facility is open Monday through Friday, 9:00 AM through 4:00 PM. In addition, each month, the Senior Advisory Committee meets at the Lathrop Senior Center, which is designed by the City of Lathrop to coordinate recreational, education, and social service opportunities for those aged fifty and above.

Lathrop Hospital and Medical Facilities

Lathrop is mostly served by hospital and medical facilities from neighboring communities in French Camp and Manteca. Health care facilities within Manteca encompass Doctor’s Hospital of Manteca, Kaiser Permanente Manteca Medical Center, residential care facilities, as well as private physicians and other medical practitioners. The primary medical facility in French Camp is San Joaquin General Hospital. Lathrop does have an urgent care clinic located within city limits.

Doctor’s Hospital of Manteca provides acute care service for Manteca and the surrounding community. The hospital is located at 1205 east North Street in the City of Manteca. Doctor’s Hospital of Manteca offers Comprehensive diagnostic and surgical services, Intensive care unit, Breast healthcare, including mammography, behavioral health care, a 67-bed adult inpatient psychiatric treatment center, expanded imaging services, hip and knee surgery, back pain treatment and surgery, bariatric (weight-loss) surgery. Kaiser Permanente Manteca Medical Center also provides acute care service for Manteca and the surrounding community. The hospital is located at 1777 West Yosemite Avenue. Residents typically travel to other facilities, for certain specialized services including severe trauma and psychiatric care.

San Joaquin General Hospital is a general acute care facility located at 500 W. Hospital Rd in the City of French Camp. The hospital contains 196-beds and provides a range of services including general medical and surgical care, high-risk obstetrics, neonatal intensive care, and pediatrics and intensive care. The associated medical campus includes primary care and specialty outpatient clinics.

The San Joaquin County Public Health Services provides maternal and child health care programming, California Children's Services, child health and disability programs, vaccinations and general public health nursing to the community. Alcohol & drug programs are also organized under the County Health Services and provide residential treatment, out-patient counseling, perinatal programs and community education and information.

3.12.2 REGULATORY SETTING

FEDERAL

There are no federal regulations applicable to the environmental topics of public services and recreation.

STATE

Fire Protection and Emergency Response

CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

In accordance with California Code of Regulations Title 8 Sections 1270 "Fire Prevention" and 6773 "Fire Protection and Fire Equipment" the California Occupational Safety and Health Administration (Cal/OSHA) has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hose sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all fire fighting and emergency medical equipment.

EMERGENCY RESPONSE/EVACUATION PLANS

The State passed legislation authorizing the Office of Emergency Services (OES) to prepare a Standard Emergency Management System (SEMS) program, which sets forth measures by which a jurisdiction should handle emergency disasters. Non-compliance with SEMS could result in the State withholding disaster relief from the non-complying jurisdiction in the event of an emergency disaster.

FIRE PROTECTION

The California Fire Code contains regulations relating to construction and maintenance of buildings and the use of premises. Topics addressed in the Code include fire department access, fire hydrants, automatic sprinkler systems, fire alarm systems, fire and explosion hazards safety, hazardous materials storage and use, provisions to protect and assist first responders, industrial processes, and many other general and specialized fire safety requirements for new existing buildings and premises.

CALIFORNIA FIRE CODE

The 2022 California Fire Code contains regulations relating to construction, maintenance, and use of buildings. Topics addressed in the California Fire Code include fire department access, fire hydrants, automatic sprinkler systems, fire alarm systems, fire and explosion hazards safety, hazardous materials storage and use, provisions intended to protect and assist fire responders, industrial processes, and many other general and specialized fire-safety requirements for new and existing buildings and the surrounding premises. The Fire Code contains specialized technical regulations related to fire and life safety.

CALIFORNIA HEALTH AND SAFETY CODE

State fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code. This includes regulations for building standards (as also set forth in the California Building Code), fire protection and notification systems, fire protection devices such as extinguishers and smoke alarms, high-rise building and childcare facility standards, and fire suppression training.

NFPA 1710

The National Fire Protection Association (NFPA) 1710 Standards are applicable to urban areas and where staffing is comprised of career Firefighters. According to these guidelines, a career fire department needs to respond within six minutes, 90 percent of the time with a response time measured from the 911 call to the time of arrival of the first responder.

The standards are divided as follows:

- Dispatch time of one minute or less for at least 90 percent of the alarms;
- Turnout time of one minute or less for EMS calls (80 seconds for fire and special operations response);
- Fire response travel time of four minutes or less for the arrival of the first arriving engine company at a fire incident and eight minutes or less travel time for the deployment of an initial full alarm assignment at a fire incident;
- Eight minutes or less travel time for the arrival of an advanced life support (ALS) (4 minutes or less if provided by the fire department.

CITY OF LATHROP MUNICIPAL CODE

The City of Lathrop Municipal Code has ordinances related to fire protection, such as Chapter 3.20 (Impact Fee Ordinance), which requires development impact fees to be charged to fund improvements to the City's infrastructure. Additionally, Chapter 1.12 (Administrative Enforcement Procedures) describes the authority of the LMFD fire marshal in determining imminent health and safety hazards, and the powers associated with such a determination. Chapter 16.28 (Improvements) describes the requirements of a subdivider to provide and connect water mains and fire hydrants to the City's water system, with approval of the number and location of fire hydrants to be determined by the Fire Chief.

Parks and Recreation

QUIMBY ACT

The Quimby Act (California Government Code Section 66477) states that "the legislative body of a city or county may, by ordinance, require the dedication of land or impose a requirement of the payment of fees in lieu thereof, or a combination of both, for park or recreational purposes as a condition to the approval of a tentative or parcel map." Requirements of the Quimby Act apply only to the acquisition of new parkland and do not apply to the physical development of new park facilities or associated operations and maintenance costs. The Quimby Act seeks to preserve open space needed to develop parkland and recreational facilities; however, the actual development of parks and other recreational facilities is subject to discretionary approval and is evaluated on a case-by-case basis with new residential development. The City has adopted park fees as allowed by the Quimby Act, as described in greater detail below.

LATHROP MUNICIPAL CODE

The Lathrop Municipal Code contains ordinances regulating park fees within the City of Lathrop. Chapter 3.20 provides for the City's Impact Fee Ordinance, which requires development impact fees to be charged to fund improvements to the City's infrastructure. Chapter 12.20 allows the city council to authorize the adoption of fees for recreation programs and for the use of park facilities for non-city functions, and provides other provisions related to parks within the City of Lathrop.

LATHROP PARKS AND RECREATION MASTER PLAN

The City of Lathrop adopted a Parks and Recreation Master Plan in 2021. The Master Plan evaluates the parks and recreation needs of the community and develop strategies, policies, and actions that reflect those needs to create better places to recreate within Lathrop. This document provides the City's Parks and Recreation Department with precise direction and be a realistic guide over the Planning Period.

Schools

CALIFORNIA CODE OF REGULATIONS

The California Code of Regulations, Chapter 4.9, Payment of Fees, Charges, Dedications, or Other Requirements Against a Development Project. Section 65995-65998 (h) The payment or satisfaction of a fee, charge, or other requirement levied or imposed pursuant to Section 17620 of the Education Code in the amount specified in Section 65995 and, if applicable, any amounts specified in Section 65995.5 or 65995.7 are hereby deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization as defined in Section 56021 or 56073, on the provision of adequate school facilities.

CALIFORNIA DEPARTMENT OF EDUCATION

The California Department of Education (CDE) School Facilities Planning Division (SFPD) prepared a School Site Selection and Approval Guide that provides criteria for locating appropriate school sites in the State of California. School site and size recommendations were changed by the CDE in 2000 to reflect various changes in educational conditions, such as lowering of class sizes and use of advanced technology. The expanded use of school buildings and grounds for community and agency joint use and concern for the safety of the students and staff members also influenced the modification of the CDE recommendations.

Specific recommendations for school size are provided in the School Site Analysis and Development Guide. This document suggests a ratio of 1:2 between buildings and land. CDE is aware that in a number of cases, primarily in urban settings, smaller sites cannot accommodate this ratio. In such cases, the SFPD may approve an amount of acreage less than the recommended gross site size and building-to-ground ratio.

Certain health and safety requirements for school site selection are governed by state regulations and the policies of the SFPD relating to:

- Proximity to airports, high-voltage power transmission lines, railroads, and major roadways;
- Presence of toxic and hazardous substances;
- Hazardous facilities and hazardous air emissions within one-quarter mile;
- Proximity to high-pressure natural gas lines, propane storage facilities, gasoline lines, pressurized sewer lines, or high-pressure water pipelines;
- Noise;
- Results of geological studies or soil analyses; and
- Traffic and school bus safety issues.

THE KINDERGARTEN-UNIVERSITY PUBLIC EDUCATION FACILITIES BOND ACT OF 2002 (PROP 47)

This act was approved by California voters in November 2002 and provides for a bond issue of $13.05 billion to fund necessary education facilities to relieve overcrowding and to repair older schools. Funds will be targeted at areas of greatest need and must be spent according to strict accountability measures. Funds will also be used to upgrade and build new classrooms in the California Community Colleges, the California State University, and the University of California in order to provide adequate higher education facilities to accommodate growing student enrollment.

LEROY F. GREENE SCHOOL FACILITIES ACT OF 1998 (SB 50)

The "Leroy F. Greene School Facilities Act of 1998," also known as Senate Bill 50 or SB 50 (Chapter 407, Statutes of 1998), governs a school district's authority to levy school impact fees. This comprehensive legislation, together with the $9.2 billion education bond act approved by the voters in November 1998 known as "Proposition 1A", reformed methods of school construction financing in California. SB 50 instituted a new school facility program by which school districts can apply for state construction and modernization funds. It imposed limitations on the power of cities and counties to require mitigation of school facilities impacts as a condition of approving new development and provided the authority for school districts to levy fees at three different levels:

- Level I fees are the current statutory fees allowed under Education Code 17620. This code section provides the basic authority for school districts to levy a fee against residential and commercial construction for the purpose of funding school construction or reconstruction of facilities. These fees vary by district for residential construction and commercial construction and are increased biannually.
- Level II fees are outlined in Government Code Section 65995.5, allowing school districts to impose a higher fee on residential construction if certain conditions are met. These

conditions include having a substantial percentage of students on multi-track year-round scheduling, having an assumed debt equal to 15–30 percent of the district's bonding capacity (percentage is based on revenue sources for repayment), having at least 20 percent of the district's teaching stations housed in relocatable classrooms, and having placed a local bond on the ballot in the past four years which received at least 50 percent plus one of the votes cast. A Facility Needs Assessment must demonstrate the need for new school facilities for unhoused pupils is attributable to projected enrollment growth from the construction of new residential units over the next five years.

- Level III fees are outlined in Government Code Section 655995.7. If State funding becomes unavailable, this code section authorizes a school district that has been approved to collect Level II fees to collect a higher fee on residential construction. This fee is equal to twice the amount of Level II fees. However, if a district eventually receives State funding, this excess fee may be reimbursed to the developers or subtracted from the amount of state funding.

LOCAL

City of Lathrop General Plan

POLICIES: PUBLIC FACILITIES AND SERVICES ELEMENT

- PFS-1.1 Service Enhancements. Encourage the implementation of new techniques and technologies to provide the best available level of community services in a cost-effective manner.
- PFS-1.4 Revenue Sources. Identify and proactively pursue local, stable, and predictable sources of revenue to meet public facility, service, and infrastructure needs.
- PFS-1.6 Capital Improvements. Maintain and fund the capital improvement program to ensure the adequate and efficient provision of public facility and municipal improvements.
- PFS-1.8 Cost Recovery. Recover the direct upfront costs and indirect long-term costs of providing services and facilities to new development through a combination of fees, exactions, and other methods based on an evaluation of long-term economic benefits and in a manner consistent with the City's cost recovery goals.
- PFS-1.9 Economic Development and Residential Growth Focus. Plan and develop public services and facilities to support economic development and residential growth.
- PFS-1.12 Infrastructure Rehabilitation. Prioritize the regular maintenance and rehabilitation of public facilities and critical Demonstrate Capacity. Require new development to demonstrate that the City's public services and facilities can accommodate the increased demand for said services and facilities associated with the project as part of the entitlement process.
- PFS-1.14 Mitigate Impacts. Require new development to offset or mitigate impacts to community services and facilities to ensure that service levels for existing users are not degraded or impaired by new development, to the satisfaction of the City.
- PFS-7.1 Fire Facilities. Encourage the Lathrop Manteca Fire Protection District (LMFD) to maintain adequate staff and equipment to provide efficient, high quality, and responsive

fire protection, police protection, and emergency medical services to existing and future growth in the city.

- PFS-7.2 Emergency Response Times. Work cooperatively with the LMFD and providers of emergency medical services to ensure acceptable response times in accordance with provider standards.
- PFS-7.4 Roadway Design and Maintenance. Design and maintain roadways to maintain acceptable emergency vehicle response times.
- PFS-7.5 Department Consultation. Coordinate with LMFD and the Lathrop Police Department in the review of new development applications to ensure that adequate attention is being paid to fire and safety concerns during the design and planning of a project.
- PFS-7.6 Crime Prevention. Promote and support community-based crime prevention programs, such as community policing, public education, youth crime prevention, and outreach programs, as an important tool to the provision of professional police services.
- PFS-7.7 Community Awareness. Support the LMFD and the Lathrop Police Department in promoting community awareness regarding crime through public service organizations, and the establishment of citizen involved programs and patrols.
- PFS-7.8 Site Design. Recognize the role of site design in crime prevention and implement best practices into existing plans and new development strategies.
- PFS-7.9 Technology. Encourage and support efforts to improve police, fire, and emergency medical services through improved use of modern technology and industry best practices.
- PFS-8.2 Adequate Facilities. Continue to engage Manteca Unified School District (MUSD) and the Banta Unified School District (BUSD) in the planning process for land use changes so that they can provide adequate educational opportunities for all students in a timely manner in accordance with the pace of residential development.
- PFS-8.3 School Siting. Continue to work with the local school districts to ensure that adequate sites are designated and facilities are planned to accommodate new residential development, with a focus on providing neighborhood schools that address the following:
    a. School locations are encouraged to be located near complimentary uses to contribute to the neighborhood character and provide opportunities for joint-use, including capacity to accommodate a broad range of programs and services and augment neighborhood parks and recreation facilities.
    b. School districts are encouraged to comply with City standards in the site design and landscaping of school facilities.
- PFS-8.5 Financing and Proportionate Share. Encourage the local school districts to properly collect required development fees so that new development funds its proportionate share of the Districts' costs for new school facilities.

POLICIES: PUBLIC SAFETY ELEMENT

- PS-2.2 Fire Protection Services. Coordinate with the Lathrop Manteca Fire Protection District (LMFD) and French Camp-McKinley Fire District (French Camp) in the provision of fire protection services to serve the city's current and future population and development.

- PS-2.6 Water Supply. Ensure that new development is served with adequate water volumes and water pressure to support fire protection, including minimum required fire flow standards for commercial, industrial and residential areas.

POLICIES: RECREATION AND RESOURCES ELEMENT

- RR-1.3 Acreage Requirements. Maintain the City adopted standard for park space acreage at 5.0 acres for every 1,000 residents, including:
  - A. 2.0 acres for every 1,000 residents for neighborhood parks; and
  - B. 3.0 acres for every 1,000 residents for community parks.
- RR-1.9 Surplus Public Agency Lands. Utilize the City's Naylor Act rights and other funding mechanisms to acquire and/or lease surplus school land and other appropriately located surplus public agency lands for open space, parks, and recreation facilities as they become available.
- RR-1.12 Funding. Continue to pursue funding from established sources and explore non-traditional funding options and innovative partnerships to bolster and support the development, improvement, and maintenance of City parks and recreational amenities.

3.12.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed Project will have a significant impact on public services if it would result in:

- Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
  - Police Protection
  - Fire Protection
  - Parks and Recreation
  - Schools
  - Other public facilities
- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

It is important to note that, in addressing public service demand issues under CEQA, including parks and recreational facilities, the appropriate focus is on the environmental effects of whatever steps might be necessary to achieve or maintain adequate service. For example, if proposed new development would create an increased demand for law enforcement or fire protection services, an EIR should inquire as to whether new or expanded physical facilities may be required in order to provide such service. The "impacts" addressed under CEQA are the physical effects of providing service, not any possible failure to provide adequate service under applicable standards. (See *City of Hayward v. Board of Trustees of the Cal. State University* (2015) 242 Cal.App.4th 833, 843 ["[t]he need for additional fire protection services is not an environmental impact that CEQA requires a project proponent to mitigate"]; *Goleta Union School Dist. v. Regents of Univ. of Cal.* (1995) 37 Cal.App.4th 1025, 1031–1034 [school overcrowding attributable to new development is not an environmental effect subject to CEQA, though the physical effects of new facility construction to serve new students would be]; and CEQA Guidelines, § 15131, subd. (a) ["[e]conomic or social effects of a project shall not be treated as significant effects on the environment"].)

This does not mean, however, that a city or county is powerless to require new development to take the steps needed to ensure adequate public services, such as law enforcement service. Such steps are simply beyond the scope of CEQA. They should instead be imposed under some other body of State statutory law (e.g., the Planning and Zoning Law [Gov. Code, § 65300 et seq.] or the Subdivision Map Act [Gov. Code, § 66410 et seq.]) or under a local government's broad police power under the California Constitution. (See Cal. Const., Art. XI, § 7*; Candid Enterprises, Inc. v. Grossmont Union High School Dist.* (1985) 39 Cal.3d 878, 885.)

It is also important to understand that special legal principles apply to impacts to school facilities. According to Government Code Section 65996, the development fees authorized by Senate Bill 50 (1998) (described earlier) are deemed to be "full and complete school facilities mitigation" for impact caused by new development. The legislation also recognized the need for the fee to be adjusted periodically to keep pace with inflation. The legislation indicated that in January 2000, and every two years thereafter, the State Allocation Board would increase the maximum fees according to the adjustment for inflation in the statewide index for school construction.

Section 65996 also prohibits public agencies from using CEQA or "any other provision of state or local law" to deny approval of "a legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property or any change in governmental organization or reorganization" on the basis of the project's impacts on school facilities.

IMPACTS AND MITIGATION MEASURES

Impact 3.12-1: The proposed project will not result in or require the construction of police department facilities which may cause substantial adverse physical environmental impacts (Less than Significant)

The City's General Plan Public Facilities and Services Element includes policies that would allow for the City's police services to continue providing adequate staffing levels. Below is a list of relevant policies:

- PFS-1.6 Capital Improvements. Maintain and fund the capital improvement program to ensure the adequate and efficient provision of public facility and municipal improvements.
- PFS-1.8 Cost Recovery. Recover the direct upfront costs and indirect long-term costs of providing services and facilities to new development through a combination of fees,

exactions, and other methods based on an evaluation of long-term economic benefits and in a manner consistent with the City's cost recovery goals.

- PFS-1.13 Demonstrate Capacity. Require new development to demonstrate that the City's public services and facilities can accommodate the increased demand for said services and facilities associated with the project as part of the entitlement process.
- PFS-7.1 Fire Facilities. Encourage the Lathrop Manteca Fire Protection District (LMFD) to maintain adequate staff and equipment to provide efficient, high quality, and responsive fire protection, and emergency medical services to existing and future growth in the City.
- PFS-7.3 Enhanced Service. Periodically review and, if necessary, amend the criteria for determining the circumstances under which fire, police, and emergency services will be enhanced.
- PFS-7.5 Department Consultation. Coordinate with LMFD and the Lathrop Police Department in the review of new development applications to ensure that adequate attention is being paid to fire and safety concerns during the design and planning of a project.

The proposed Project includes the development of new residential units that would result in direct population growth and an increase in demand for police services. The City collects impact fees from new developments based upon projected impacts from each development. The City also reviews the adequacy of impact fees on an annual basis to ensure that the fee is commensurate with the service. Payment of the applicable impact fees by the Project applicant, and ongoing revenues that would come from property taxes, sales taxes, and other revenues generated by the Project, would fund capital and labor costs associated with police services.

According to the City's General Plan Update Draft EIR, development and growth facilitated by the General Plan would result in increased demand for public services, including fire protection, law enforcement, schools, parks, libraries, and other public and governmental services. As the demand for services increases, there will likely be a need for new or expanded service structures (e.g., office, maintenance, and administrative buildings and facilities, schools, parks, fire facilities, libraries, etc.) to provide for adequate staffing, equipment, and appropriate facilities to serve growth in the City. Existing facilities may be expanded at their current location. New facilities may also be constructed. The Public/Quasi-Public, Park, and Open Space land use designations would accommodate the majority of new public facilities necessary to provide community services. There would likely be environmental impacts associated with the construction or expansion of the facilities needed to provide public services. Such development would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA. Any future expansion of public facilities required by growth in the City would be required to be reviewed for site-specific impacts.

The approval and/or pending development projects in the City will result in additional demand for law enforcement services. Capital costs for new facilities and equipment are funded through development impact fees, and operational costs are funded through a combination of an increased tax base, participation in CFD and Measure C funding.

The new Lathrop Police Department station is located approximately one-half mile from the proposed Project site. Opened in June 2022, this new facility serves as the base of operations for the Lathrop Police Department and is tasked with crime prevention, review of new development applications, community awareness and more. Based on population estimates, the City has approximately one sworn officer per 962 residents. The proposed Project includes the development of new residential units that would result in direct population growth. The Department of Finance estimates an average of 3.48 people per household in Lathrop in 2025. Based on the anticipated number of residential units that will be built on the Project site (912 units), the population would be anticipated to increase by an estimated 3,173 persons. It is noted that the Mossdale Landing West Specific Plan provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units per acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the analysis is conservative, as the number of units constructed at buildout would likely be closer to 829, as shown on the Vesting Tentative Subdivision Map. Utilizing the 829 unit value, the population is anticipated to increase by an estimated 2,884 persons. In order to maintain the current officer to population ratio, the City would require three additional sworn officers which would be accommodated at the new Lathrop Police Department station.

The proposed Project would not result in, or have the potential to require, the construction of police department facilities which may cause substantial adverse physical environmental impacts; therefore, development of the Project would not directly trigger the need for a new facility. Furthermore, payment of the applicable developer impact fees by the Project applicant, as required by the City's General Plan Public Facilities and Services Element Policy PFS-1.8, in addition to ongoing revenues that would be generated by property taxes and other proceeds generated by the Project, would fund these public service needs created by the proposed Project.

The proposed Project does not trigger the need for a police station or expansion of existing facilities. Therefore, the Project will have a ***less than significant*** impact relative to this topic.

Impact 3.12-2: The proposed project will not require the construction of fire department facilities which may cause substantial adverse physical environmental impacts (Less than Significant)

The City's General Plan Public Facilities and Services Element and Public Safety Element include policies and actions that would allow for LMFD to continue providing adequate facilities and staffing levels. Below is a list of relevant policies:

- PFS-1.6 Capital Improvements. Maintain and fund the capital improvement program to ensure the adequate and efficient provision of public facility and municipal improvements.
- PFS-1.8 Cost Recovery. Recover the direct upfront costs and indirect long-term costs of providing services and facilities to new development through a combination of fees, exactions, and other methods based on an evaluation of long-term economic benefits and in a manner consistent with the City's cost recovery goals.
- PFS-1.13 Demonstrate Capacity. Require new development to demonstrate that the City's public services and facilities can accommodate the increased demand for said services and facilities associated with the project as part of the entitlement process.

- PFS-7.1 Fire Facilities. Encourage the Lathrop Manteca Fire Protection District (LMFD) to maintain adequate staff and equipment to provide efficient, high quality, and responsive fire protection, and emergency medical services to existing and future growth in the city.
- PFS-7.3 Enhanced Service. Periodically review and, if necessary, amend the criteria for determining the circumstances under which fire, police, and emergency services will be enhanced.
- PFS-7.5 Department Consultation. Coordinate with LMFD and the Lathrop Police Department in the review of new development applications to ensure that adequate attention is being paid to fire and safety concerns during the design and planning of a project.
- PFS-7b The LMFD and the Public Works Department will review proposed development projects and street networks to evaluate the accessibility for fire engines and other emergency response functions.
- PS-2.2 Fire Protection Services. Coordinate with the Lathrop Manteca Fire Protection District (LMFD) and French Camp Mckinley Fire District (French Camp) in the provision of fire protection services to serve the city's current and future population and development.
- PS-2.6 Water Supply. Ensure that new development is served with adequate water volumes and water pressure to support fire protection, including minimum required fire flow standards for commercial, industrial and residential areas.

The proposed Project includes the development of new residential units that would result in direct population growth and an increase in demand for fire and emergency response services. The City of Lathrop collects impact fees from new developments based upon projected impacts from each development. The adequacy of impact fees is reviewed on an annual basis to ensure that the fee is commensurate with the need for new fire stations and expanded fire services to serve areas of Lathrop. The proposed Project is required to pay its fair share of the fire impact fee. Payment of the applicable impact fees by the Project applicant, and ongoing revenues that would come from property taxes, sales taxes, and other revenues generated by the Project, would fund capital and labor costs associated with fire protection services.

As noted above in Impact 3.12-1, according to the City's General Plan Update Draft EIR, development and growth facilitated by the General Plan would result in increased demand for public services, including fire protection, law enforcement, schools, parks, libraries, and other public and governmental services. The LMFD would provide fire protection and emergency services to the Project, and LMFD Station 34, located at 460 River Islands Parkway, is within one-half mile of the Project. LMFD also operates two additional fire stations and has plans to construct three additional fire stations in the City.

As the demand for services increases, there will likely be a need for new or expanded service structures (e.g., office, maintenance, and administrative buildings and facilities, schools, parks, fire facilities, libraries, etc.) to provide for adequate staffing, equipment, and appropriate facilities to serve growth in the City. Existing facilities may be expanded at their current location, and they would have capacity to welcome additional employees and staff. Such development would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA. Any future expansion of public facilities required by growth in the City would be required to be reviewed for site-specific impacts.

The Project would be required to comply with the requirements of the General Plan Public Facilities and Services Element, including Policy PFS-1.8, to recover the costs of providing public services from new developments; Policy PFS-1.13, requiring a demonstration of capacity to provide public services for new development projects; and Policy PFS-7.5, which requires consultation with Lathrop Police Department and LMFD to review site plans for new development projects to ensure that safety concerns are adequately addressed. Fire sprinklers are required by the California Fire Code and will be incorporated into the proposed Project. Additionally, the Project includes fire access and fire hydrants as required by current City standards, in order to provide fire suppression access.

The proposed Project does not trigger the need for a fire station or expansion of existing facilities. Therefore, the Project will have a ***less than significant*** impact relative to this topic.

Impact 3.12-3: The proposed Project will not increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated, but the proposed Project will require the construction of park and recreational facilities which may cause substantial adverse physical environmental impacts. (Less than Significant)

PARK STANDARDS/REQUIREMENTS

The City's General Plan Recreation and Resources Element includes policies and actions related to providing adequate park facilities. Below is a list of relevant policies:

- RR-1.3 Acreage Requirements. Maintain the City adopted standard for park space acreage at 5.0 acres for every 1,000 residents, including:
  - A. 2.0 acres for every 1,000 residents for neighborhood parks; and
  - B. 3.0 acres for every 1,000 residents for community parks.
- RR-1.9 Surplus Public Agency Lands. Utilize the City's Naylor Act rights and other funding mechanisms to acquire and/or lease surplus school land and other appropriately located surplus public agency lands for open space, parks, and recreation facilities as they become available.
- RR-1.12 Funding. Continue to pursue funding from established sources and explore non-traditional funding options and innovative partnerships to bolster and support the development, improvement, and maintenance of City parks and recreational amenities.

PARKS PROVIDED

The proposed Project provides for the development of approximately 16.5 acres of Public designated uses that are made up of: parks and open space areas, consisting of approximately 4.8 acres of linear parks, a 6.2-acre neighborhood park, two acres of parkland dedication, and 3.6 acres of other public green spaces, with a variety of passive and active recreational opportunities.

The proposed Project includes residential units that would result in direct population growth. Quimby Act standards include dedication of three to five acres per 1,000 residents in a given jurisdiction to ensure that adequate parkland is provided along with the development of housing. The City of Lathrop has further refined its standard to require three acres of community park per 1,000 residents and two acres of neighborhood park per 1,000 residents. Per the City's General Plan, minimum acreages apply to the sizes of individual community and neighborhood parks.

As such, even though the proposed Project would provide sufficient parkland to meet the Quimby Act park dedication standard, it does not provide sufficient community park acreage to meet the City's minimum park land requirement, based on the previous Department of Finance estimate of 3.65 persons per dwelling unit. While the Project would result in sufficient neighborhood park acreage, there would still be a deficit of approximately 1.62 acres of community parkland. The remaining 1.62 acres of required parkland shall be mitigated through in-lieu fees paid to the City by the developer.

As previously discussed, there are an estimated 3.48 persons per dwelling unit in the City of Lathrop. If considering an additional Project population of 3,173 persons based on the more conservative estimate of 912 units developed, the Project would be required to provide a total of 9.52 acres of neighborhood park acreage and 6.35 acres of community park acreage. The Vesting Tentative Map for the Project includes 6.2 acres of neighborhood park and no community park area; however, the Vesting Tentative Map does include other park and open space areas, including approximately 4.8 acres of linear park, approximately 2.0 acres of parkland dedication south of River Islands Parkway, approximately 2.1 acres of other open space (including landscaped entries), approximately 1.4 acres of levee slope easement, and a remainder of 38.2 acres of undeveloped land. Nevertheless, this would result in a deficit of 3.32 acres of neighborhood park acreage and a deficit of 6.35 acres of community park acreage. When considering the more realistic Project population of 2,884 persons based on 829 units developed, the Project would be required to provide 8.65 acres of neighborhood park acreage and 5.77 acres of community park acreage. This would result in a deficit of 2.45 acres of neighborhood park and 5.77 acres of community park.

Project implementation would require the construction of park facilities which may cause substantial adverse physical environmental impact. Potential environmental impacts associated with the future construction of park and other recreational facilities within the Plan Area are addressed throughout this EIR. This EIR analyzes the physical environmental effects that may occur as a result of development and introduction of new residential uses within the Plan Area. Project-related parkland would fall within the range of environmental impacts disclosed in this EIR and would be subject to relevant mitigation measures included in this EIR. Conformance with the General Plan, applicable City requirements, and the payment of appropriate fees, would reduce impacts related to the development of parkland. Therefore, the Project will have a ***less than significant*** impact relative to this topic.

Impact 3.12-4: Project implementation will not result in the need for the construction of new schools which have the potential to cause substantial adverse physical environmental impacts (Less than Significant)

The City's General Plan Public Facilities and Services Element includes policies and actions related to schools. Below is a list of relevant policies:

- PFS-8.2 Adequate Facilities. Continue to engage Manteca Unified School District (MUSD) and the Banta Unified School District (BUSD) in the planning process for land use changes so that they can provide adequate educational opportunities for all students in a timely manner in accordance with the pace of residential development.
- PFS-8.3 School Siting. Continue to work with the local school districts to ensure that adequate sites are designated and facilities are planned to accommodate new residential development, with a focus on providing neighborhood schools that address the following:
  a. School locations are encouraged to be located near complimentary uses to contribute to the neighborhood character and provide opportunities for joint-use, including capacity to accommodate a broad range of programs and services and augment neighborhood parks and recreation facilities.
  b. School districts are encouraged to comply with City standards in the site design and landscaping of school facilities.
- PFS-8.5 Financing and Proportionate Share. Encourage the local school districts to properly collect required development fees so that new development funds its proportionate share of the Districts' costs for new school facilities.

The Project proposed new residential development which would result in a direct population increase, including an increase of school-aged children. The Project does not propose to establish a school within the Plan Area. Mossdale Elementary School, serving students in grades K through 8, was built during the development of Mossdale Village, and it is the closest elementary school to Project site. Lathrop High School is the closest high school for children attending school between grades 9 through 12. MUSD will determine existing school capacities and assign attendance as appropriate.

MUSD's School Facilities Fee Justification Report provides student generation factors to estimate the impact on enrollment of non-mitigated future units. Single family detached units, as proposed by the Project, are assigned the following student generation factors per dwelling unit:[9]

- 0.2966 for elementary school (grades K through 6)

[9] Manteca Unified School District, School Facilities Fee Justification Report, Prepared Pursuant to Government Code Section 66001, 2022/2023, June 26, 2022. Available at: https://resources.finalsite.net/images/v1717710610/mantecausdnet/vxdyhrxekdduinhoduyx/SFJ_MantecaUSD_2024.pdf. Accessed May 2024.

- 0.0878 for middle school (grades 7 through 8)
- 0.1864 for high school (grades 9 through 12)

Based on MUSD's student generation factors, the Project's 912 dwelling units would conservatively generate approximately 271 new elementary school students, 81 middle school students, and 170 high school students. Utilizing the more realistic development estimate of 829 dwelling units, the Project would generate approximately 246 new elementary school students, 73 middle school students, and 155 new high school students.

MUSD would collect impact fees from new developments under the provisions of SB 50. Payment of the applicable impact fees by the Project applicant, and ongoing revenues that would come from taxes, would fund capital and labor costs associated with school services. The adequacy of fees is reviewed on an annual basis to ensure that the fee is commensurate with the service. Payment of the applicable impact fees by the Project applicant, and ongoing revenues that would come from property taxes, sales taxes, and other revenues generated by the proposed Project, would fund improvements associated with school services. According to Government Code Section 65996, the development fees authorized by SB 50 (1998) are deemed to be "full and complete school facilities mitigation" for any demands or impacts on school facilities caused by new development.

Any new facilities from either School District are planned and constructed by each respective School District in accordance with the Education Code. Any such construction activity would require CEQA compliance, and the School District would serve as lead agency. The proposed project does not propose any new school facilities within the Project Area, and there are no indications that either School District would need to construct new facilities as a result of student generation resulting from the proposed Project. Compliance with applicable regulations, including the City's General Plan and SB 50, would reduce potential impacts related to schools. Implementation of the proposed Project would have a ***less than significant*** impact relative to this topic.

Impact 3.12-5: The proposed Project will not have significant effects on other public facilities. (Less than Significant)

The proposed Project would increase demand for other public facilities within the City of Lathrop, such as libraries, and community/recreation buildings. However, to mitigate increased demand on library and community facilities, the City collects public facilities impact fees from new development based upon projected impacts from the development. The City also reviews the adequacy of impact fees on an annual basis to ensure that the fee is commensurate with the service or facility.

The proposed Project is anticipated to include community benefits, including trails, park and open space areas, and a variety of outdoor amenities. The proposed Project includes a large community park, which is anticipated to provide various public recreational activities for residents and nearby neighbors to socialize and connect.

The proposed Project could result in new demands on other public services such as libraries, etc. The City collects impact fees from new development based upon projected impacts from each development, including impacts on other public services. The City also reviews the adequacy of impact fees on an annual basis to ensure that the fee is commensurate with services provided.

Payment of the applicable impact fees by the Project applicant, and ongoing revenues that would come from property taxes, sales taxes, and other revenues generated by the proposed Project, would fund capital and labor costs associated with these other public services.

The proposed Project does not trigger the need for new other public facilities, such as libraries, and consequently, none are proposed at this time. Compliance with General Plan policies and all other applicable regulations would further reduce impacts related to the provision of public facilities. Implementation of the proposed Project would have a ***less-than-significant*** impact relative to this topic.

This page left blank intentionally.

This section of the EIR analyzes the potential impacts of the proposed Project on the surrounding transportation system including roadways, bicycle/pedestrian facilities, and transit facilities/services. This section identifies the significant impacts of the proposed Project and recommends mitigation measures to lessen their significance. An evaluation of vehicular access to the Project area is also provided. The Traffic Impact Analysis Report is included in Appendix E of this Draft EIR.

3.13.1 ENVIRONMENTAL SETTING

PROJECT LOCATION

The Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site) is located within the West Lathrop Specific Plan (WLSP) area in the City of Lathrop, San Joaquin County. Figures 2.0-1 and 2.0-2 in Chapter 2.0, Project Description, show the Project's regional location and vicinity. The site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south.

The Project site includes two distinct planning boundaries defined below. The following terms are used throughout this Draft EIR to describe the planning boundaries within the Project site:

- **Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site)** – totals 225.86 acres and includes the whole of the Project, including the proposed 167.42-acre Development Area, and land along the San Joaquin River (which would not be developed as part of the proposed Project).

- **Development Area** – includes 167.42 acres that is intended for development.

PROJECT AREA ROADWAYS AND INTERSECTIONS

State Highways

Three highways operated and maintained by the California Department of Transportation (Caltrans) pass through Lathrop: Interstate (I) I-5, I-205, and State Route (SR) 120.

I-5 is a six-lane freeway running through the center of the City. I-5 is a primary route connecting the City of Lathrop with Stockton and Sacramento to the north and Los Angeles to the south. I-5 has interchanges with I-205 and SR 120 in the southern portion of the City. I-5 has interchanges at the following City streets:

- Roth Road
- Lathrop Road
- Louise Avenue
- Mossdale Road (northbound access only)
- Manthey Road (southbound access only)

I-205 is a six-lane freeway that has an interchange with I-5 at its east terminus in the southern portion of the City. To the west, I-205 connects to Tracy and the Bay Area.

SR 120 is a four-lane freeway that has an interchange with I-5 at its west terminus in the southern portion of the City. It continues through Manteca and has an interchange at Yosemite Avenue, serving eastern sections of Lathrop. A new interchange is planned at McKinley Avenue. SR 120 connects with SR 99 about six miles east of I-5, where it continues as an arterial east of SR 99 and as an expressway east of the Manteca city limit. To the east, SR 120 connects to Yosemite National Park and the Sierra.

Roadways

A description of the existing road systems is provided below:

Golden Valley Parkway is primarily a six-lane divided arterial from Spartan Way to its southern terminus at Brookhurst Boulevard. Golden Valley Parkway will serve as the primary north-south arterial for residents in Mossdale Village and Central Lathrop. Much of the land surrounding Golden Valley Parkway is currently being developed, Golden Valley Parkway will provide access to single-family homes and Lathrop Marketplace. In the Project vicinity, the posted speed limit is 50 miles per hour (mph) north of River Island Parkway and 45 mph south of River Island Parkway.

Spartan Way / Lathrop Road is primarily a four- to six-lane divided arterial from its western terminus at Barbara Terry Boulevard and its eastern terminus at Austin Road in Manteca. In the Project vicinity, the majority of land uses will be primarily single-family homes and educational facilities. The posted speed limit on Lathrop Road / Spartan Way is 35 mph.

Stanford Crossing Drive is primarily a two-lane undivided road that spans from Spartan Way to Golden Valley Parkway.

River Islands Parkway / Louise Avenue is primarily a four- to six-lane divided arterial that runs east-west through the City of Lathrop. To the west, the roadway terminates near the Old River. From there, the roadway extends several miles eastward and terminates at Ripon Road, near French Camp Road. The roadway currently tapers to two-lanes crossing the San Joaquin River. It is intended that the river crossing will ultimately be widened to four-lanes. In the Project vicinity, River Islands Parkway primarily serves for residents in Mossdale Village and Central Lathrop and has a posted speed limit of 45 mph.

Town Centre Drive is primarily a two-lane undivided road from Village Avenue to Manthey Road. The roadway has a posted speed limit of 25 mph. In the vicinity of the Project site, Town Center Drive primarily serves single-family homes.

Barbara Terry Boulevard is primarily a two-lane undivided road from Locomotive Street to Lathrop Road and has a posted speed limit of 35 mph.

McKee Boulevard is a two-lane undivided road in the Project vicinity. The posted speed limit on McKee Boulevard is 35 mph.

EXISTING PEDESTRIAN AND BICYCLE FACILITIES

The pedestrian and bicycle facilities in the study area are described below.

Pedestrian Facilities

Pedestrian facilities are comprised of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access the destinations such as institutions, businesses, public transportation, and recreation facilities.

Near the proposed Project site, the approximate width of the sidewalk on both sides of the River Island Parkway is eight feet. There is currently an approximately six-foot wide sidewalk along Barbara Terry Boulevard on one side of the street. The signalized intersections near the proposed development provide marked crosswalks and pedestrian push buttons and signal heads. The existing pedestrian facilities in the study area are shown in Figure 3.13-1.

Bicycle Facilities

The *1995 City of Lathrop Bicycle Transportation Plan* outlines policies and objectives to improve the current active bicycle facilities. The various bicycle facilities are described below:

- **Class I Bikeways (Bike Paths or Shared-Use Path)**: Class I Bikeways provide a completely separated right of way for bicycles and pedestrians with minimal crossflow by motorized vehicles. Bike paths provide a recreational opportunity or can serve as commute routes. In the Plan Area, there are no Class I facilities.
- **Class II Bike Lanes**: Class II bike lanes are striped bike lanes immediately adjacent to a traffic lane. Bike lanes provide a pavement area separate from vehicular traffic and improve conditions for bicycles on roadways. In the Project vicinity, Class II Bike Lanes are provided on River Island Parkway.
- **Class III Bike Routes**: Class III Bike Routes provide shared use of the roadway, designated by signs or pavement markings and shared with other vehicular traffic. There are no Class III Bike Routes in the Project vicinity.
- **Class IV Separated Bikeways or Cycle Tracks**: Cycle tracks are separated bikeways for the exclusive use of bicycles. Cycle tracks are usually located along the roadway, but require separation from the vehicular travel lane in the form of grade separation, planters, flexible posts, or on-street parking. There are no Class IV bikeways in the Project vicinity.

Existing bicycle facilities are illustrated in Figure 3.13-1.

TRANSIT SERVICE

San Joaquin Regional Transit District (RTD) provides transit service throughout San Joaquin County. Table 3.13-1 summarizes the existing San Joaquin RTD services in the Project vicinity. The two routes only operate on weekdays. Existing transit services in the vicinity of the Project site are illustrated in Figure 3.13-1. As shown, three bus stops are located east of the Project site near E Louise Avenue.

TABLE 3.13-1: EXISTING SAN JOAQUIN RTD TRANSIT SERVICE

ROUTE	*FROM*	*TO*	*OPERATING HOURS*	*HEADWAY (HOURS)*
90	Tracy Transit Station	San Joaquin Delta College (Pacific & Yokuts, Stockton)	5:37 a.m. – 9:11 p.m.	Varies (~1 hour)
97	Tracy Transit Station	Manteca Transit Station	6:00 a.m. – 9:00 p.m.	Varies (~1.3 hours)

SOURCE: SAN JOAQUIN RTD TRANSIT WEBSITE.

3.13.2 REGULATORY SETTING

Existing transportation policies, laws, and regulations that would apply to the proposed Project are summarized below. This information provides a context for the impact discussion related to the proposed Project's consistency with applicable regulatory conditions and development of significance criteria for evaluating Project impacts.

FEDERAL

No federal plans, policies, regulations, or laws pertaining to transportation have been determined to be applicable to this Project.

STATE

Senate Bill 743

Senate Bill (SB) 743 (Steinberg, 2013), enacted in 2013, created Public Resources Code section 21099, which directed the Governor's Office of Planning and Research (OPR) and the Secretary of the Natural Resources Agency to establish criteria for determining the significance of transportation impacts of projects within transit priority areas, with the option of creating new statewide criteria. The significance criteria for transit priority areas were to promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses. In developing the new criteria, OPR and the Secretary were to recommend potential metrics that included, but were not limited to, vehicle miles traveled [VMT], vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated. Section 21099 further provided that, once the California Environmental Quality Act (CEQA) Guidelines had been updated as required by the statute, "automobile delay, as described solely by level of service [LOS] or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to [CEQA], except in locations specifically identified in the guidelines, if any."

Consistent with these directives, the Natural Resources Agency promulgated CEQA Guidelines section 15064.3, which became effective in late 2018. It provides that "[g]enerally, vehicle miles traveled is the most appropriate measure of transportation impacts," with VMT referring to "the amount and distance of automobile travel attributable to a project. Other relevant considerations may include the effects of the project on transit and non-motorized travel." Rather than limit its scope only to transit priority areas, the section changed the approach to assessing transportation impacts under CEQA all over the State. By its own terms, however, the section did not require agencies to begin using VMT as a new metric until July 1, 2020. LOS had ceased to be a valid significance criterion as of late 2018, however. (See *Citizens for Positive Growth & Preservation v. City of Sacramento* (2019) 43 Cal.App.5th 609, 625-626.)

In December 2018, OPR published final technical guidance for implementing CEQA Guidelines Section 15064.3. While this document does not have the force of law, the technical guidance provides helpful information to agencies such as the City, and sets forth OPR's own understanding of the best strategies for implementing Section 15064.3.

Caltrans

Caltrans is responsible for planning, designing, constructing, operating, and maintaining all state-owned roadways in California. Federal highway standards are implemented in California by Caltrans. Any improvements or modifications to the state highway system within the City of Lathrop need to be approved by Caltrans. The City of Lathrop does not have the ability to unilaterally make improvements to the state highway system.

TRAFFIC STUDY GUIDELINES

The Caltrans document *Transportation Impact Study Guide* (California Department of Transportation 2020) identifies circumstances under which Caltrans determines that a traffic impact study would be required. The document also details information that is to be included in the study, analysis scenarios, and guidance on acceptable analysis methodologies, including CEQA focus on VMT rather than level of service (LOS), alternative transportation modes and safety.

LOCAL

City of Lathrop General Plan

GOALS: CIRCULATION

- CIR-1 Develop and maintain a roadway system that accommodates all users.
- CIR-2 Create a system of pedestrian, bicycle, and transit facilities that enables non-automotive accessibility and increases the health and livability of the community.
- CIR-4 Plan for the future of transportation to ensure accessibility for all, reduce the environmental impact of transportation and improve the quality of life.

POLICIES: CIRCULATION

- CIR-1.1 Roadway Network. Provide a roadway network that is consistent with the planned improvements shown in the Circulation Element Map (Figure CIRC-1).
- CIR-1.2 Complete Streets. Consider all modes of travel in planning, design, and construction of all transportation projects to create safer, more livable, and more inviting environments for pedestrians, bicyclists, motorists and public transit users of all ages and capabilities.
- CIR-2.1 Bicycle and Pedestrian Networks. Establish a network of identified bicycle and pedestrian routes connecting residential areas with schools, recreation, shopping, and employment areas within the City.
- CIR-2.2 Safety. Improve safety conditions, efficiency, and comfort for bicyclists and pedestrians by providing shade trees and controlling traffic speeds by implementing narrow lanes or other traffic calming measures.
- CIR-2.4 Transit Access. Provide safer, more convenient access to transit service including rail, bus, and paratransit.
- CIR-2.5 Amenities. To support bicycle, pedestrian, and transit usage, provide amenities including pedestrian-scale lighting, bicycle parking, shade trees and landscaping, and bus shelters and benches.
- CIR-4.1 Land Use Supporting Reduced VMT. Support land use with increased land use densities and mixed-uses, consistent with the Land Use Element, to reduce vehicle miles traveled and promote the use of walking, biking, and transit.

IMPLEMENTATION ACTIONS: CIRCULATION

- CIR-1b Require development projects to arrange streets in an interconnected pattern, so that pedestrians, bicyclists, and drivers are not forced onto arterial streets for inter- or intra-neighborhood travel. This approach will also increase the safety and efficiency of movement of emergency responders and reduce vehicle miles traveled within the community.
- CIR-2g Ensure that development and infrastructure projects are designed to provide pedestrian and bicycle access and leave no gaps in the bicycle and pedestrian networks.
- CIR-4c Require proposed development projects that could have a potentially significant VMT impact to consider reasonable and feasible project modifications and other measures during the project design and environmental review stage of project development that would reduce VMT effects in a manner consistent with state guidance on VMT reduction.

City of Lathrop VMT Screening Criteria and Thresholds of Significance

Resolution No. 20-4784, adopted by the City Council on September 14, 2020, enacted the following levels of significance for land use projects in the City:

- **Residential projects**: 15 percent below existing (baseline) citywide VMT per household or per resident

- **Office projects**: 15 percent below existing (baseline) citywide VMT per employee
- **Retail projects**: A net increase in existing (baseline) citywide VMT per employee
- **Mixed-use projects**: Evaluate each land use separately

Baseline VMT is defined as the average VMT per project type for the City of Lathrop under Baseline Year 2020 conditions using the City of Lathrop Travel Demand Model.

The resolution also adopted the following screening criteria to quickly identify when a project should be expected to cause a less than significant VMT impact without conducting a detailed VMT analysis:

- **Small projects**: Generation of less than 110 daily trips
- **Projects located in low-VMT areas**: Projects in areas with low VMT (to be identified as part of the General Plan update), with similar features (i.e., density, mix of uses, and transit accessibility) to the nearby developments
- **Projects in proximity to a major transit stop**: Projects located within a half-mile of an existing or planned high-quality transit corridor or major transit station. In Lathrop, this includes the existing Lathrop ACE station, the future Valley Link station, and at stops for bus routes with headways of 15 minutes or less. This criterion does not apply if a project
    - Has a floor area ratio (FAR) of less than 0.75;
    - Includes more parking than required by the City of Lathrop;
    - Is inconsistent with the SJCOG RTP/SCS; or
    - Replaces affordable residential units with a smaller number of moderate- or high-income residential units.
- **Affordable housing**: Residential projects containing a particular amount of affordable housing (based on local circumstances and substantial evidence as determined by the City
- **Local-serving retail**: Local-serving retail projects of less than 50,000 square feet. Staff shall evaluate both the project characteristics and the context of the project location to decide as to whether a given retail project is local serving.
- **Transportation projects that do not result in an increase in VMT**: Transit projects, bicycle and pedestrian projects, and roadway projects that do not result in an increase in vehicle capacity or VMT

City of Lathrop Bicycle Transportation Plan

The *1995 Lathrop Bicycle Transportation Plan*, last updated in 2004, was developed to improve and expand bicycling opportunities in Lathrop. The Bicycle Transportation Plan provides an additional level of refinement to the General Plan's Transportation and Circulation Element by providing a detailed set of policies and programs for bicycle circulation improvement. The Plan establishes bicycle goals, objectives, and policies; identifies future bicycle infrastructure projects; and promotes support facilities and educational programs. The following goal and objectives were established by the Plan:

Goal A: To create a bikeway system that provides for convenient and safe bicycle circulation throughout Lathrop and maximizes the number of bicycle commuters.

Objective A.1: Provide a comprehensive network of bikeways that provides access to destination points throughout the community.

Objective A.2: Assure bikeways are fully integrated into all future development occurring within the City's General Plan Sphere.

Objective A.3: Provide route linkages to regional bikeways.

Objective A.4: Provide for a high level of rider safety along all bikeways.

City of Lathrop Active Transportation Plan

The public draft of the City's Active Transportation was released in February 2024. The Active Transportation was subject to a public review and comment period from March 1 to April 1, 2024. While not yet adopted by the City, this Plan will establish a long-term vision for improving walking and bicycling within Lathrop and identify a short-term action plan of implementable projects, programs, and policies. The Active Transportation provides a strategy to develop connected citywide walking and bicycling facilities that provide access between residential neighborhoods, schools, transit, and jobs. These network improvements are combined with options for recommended education, encouragement, and evaluation programs to provide a comprehensive approach to improving active transportation in Lathrop. The Active Transportation also identifies a plan to implement these projects and programs through prioritization to ensure implementation is manageable and achievable.

City of Lathrop Design and Construction Standards

The City's design and construction standards and standard details provide for coordinated and standardized development of City facilities, including roadways. The standards apply to, regulate, and guide the design and preparation of plans, and the construction of streets, highways, alleys, drainage, traffic signals, site access, and related public improvements. All public roadway infrastructure improvements must be designed and constructed in accordance with the city standards and Caltrans' Standard Specifications (Caltrans 2018).

San Joaquin Council of Governments Regional Transportation Plan and Sustainable Community Strategy

The current San Joaquin Council of Governments (SJCOG) Regional Transportation Plan and Sustainable Community Strategy (RTP/SCS) produced by SJCOG was adopted in 2022. The RTP/SCS is the region's comprehensive long-range transportation planning document and serves as a guide for achieving public policy decisions that will result in balanced investments for a wide range of multimodal transportation improvements. The RTP/SCS also demonstrates how land use development and transportation can work together to meet greenhouse gas emission reduction targets for cars and light trucks. The RTP/SCS states that it "recognizes the significant impact the transportation network has on the region's public health, mobility, and economic vitality" and "serves as a guide for achieving public policy decisions that will result in balanced investments for a wide range of multimodal transportation improvements."

3.13.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

The transportation analysis assesses how the study area's transportation system would operate with the implementation of the proposed Project. The analysis includes effects that would result in significant impacts as set forth in the CEQA Guidelines.

The proposed Project's impact is not considered to be significant unless it would:

a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.
b) Conflict or be inconsistent with CEQA Guideline section 15064.3, subdivision (b).
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
d) Result in inadequate emergency access.

Significance criteria "b" is related to the implementation of VMT as the primary performance metric.

VMT Analysis Methodology

SB 743 is intended to reduce greenhouse gas emissions and particulates, encourage infill development and a diversity of uses instead of sprawl, and promote multi-modal transportation networks.

The SJCOG 2018 RTP Model was used to evaluate changes in VMT due to land use developments. For the purposes of this analysis, the screening guidelines and significance thresholds that are contained in the City's VMT guidelines are utilized. If a project does not meet any screening criteria, the draft guidelines specify use of the SJCOG RTP Travel Demand Model to identify the appropriate project VMT. Since the 2022 SJCOG RTP Travel Demand Model has not been certified by the California Air Resources Board, the 2018 RTP Model was used.

CITY OF LATHROP SCREEN CRITERIA

The adopted guidelines include the following screening criteria for identifying projects that can be presumed to have a less-than-significant impact:

- Small projects,
- Projects located in low VMT areas,
- Projects in proximity to a major transit stop,

- Affordable housing,
- Local serving retail, and
- Transportation projects.

SIGNIFICANCE STANDARDS

The State of California provides lead agencies latitude in adopting standards of significance for evaluating VMT impacts associated with land use projects. For this analysis, the City of Lathrop SB 743 guidelines were used to analyze the proposed Project.

Based on the City's guidelines, for a project to be VMT insignificant, the Project has to generate 15 percent below the area-wide average for the total home-based VMT statistic. If the Project generates a higher VMT, then the project would be considered to have a "significant" impact.

Transit, Roadway, Bicycle, and Pedestrian Facilities

Appendix G of the CEQA Guidelines indicates that impacts may be significant if a project conflicts with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. The proposed Project would have a significant impact on transit, bicycles, or pedestrians if it would conflict with adopted policies, plans, or programs regarding these systems, or create or exacerbate disruptions to the performance or safety of these systems.

IMPACTS AND MITIGATION MEASURES

Impact 3.13-1: Implementation of the Project would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. (Less Than Significant)

Development associated with the proposed Plan would increase the amount of multimodal transportation activity which would require the improvement and expansion of the local transportation network in the Specific Plan Area to serve the associated travel demand. The significance of the Specific Plan's multi-modal impacts is discussed below.

TRANSIT SERVICE AND FACILITIES

Existing bus routes do not pass directly by the Specific Plan Area. The Project site is within a 1.5 mile of two San Joaquin RTD bus stops, located on the northwest corner of E Louis Avenue/Harlan Road Intersection. Implementation of the Specific Plan does not physically disrupt an existing transit service or facility nor interfere with implementation of a planned transit service or facility.

As the Specific Plan Area access is not adjacent to any transit facility, the Specific Plan does not result in increased potential for safety conflicts involving transit vehicles and other modes of travel. It is noted, however, that new transit service is desired within the Specific Plan Area, and turnouts and bus stops will be provided to accommodate transit in coordination with the transit providers. As discussed in Chapter 2.0, two bus stops are proposed along Town Centre Drive. As such, development of the Plan Area would increase opportunities for bus usage for the proposed residents.

The Specific Plan's impact to transit service and facilities would be ***less than significant***.

BICYCLE FACILITIES

The City adopted a Bicycle Transportation Plan that establishes the City's goals and objectives for bicycle travel. The Bicycle Transportation Plan establishes standards for bicycle facilities and identifies planned bicycle network facilities to address the City's bicycle needs. The Specific Plan is consistent with the City's Bicycle Transportation Plan, since it includes a basic bikeway system and includes a Class I bike path in an open space corridor.

The Specific Plan does not interfere with use of the existing type II bicycle facility on River Island Parkway near the Specific Plan Area. The Specific Plan does not interfere with implementation of a planned bicycle facility. Some proposed residents may elect to ride bicycles within and outside of the Specific Plan Area for recreation, to retail destinations, entertainment, employment and schools, and the amount of proposed bicycle travel has been considered. It is noted that the Specific Plan includes a variety of bicycle facilities, including Class II bike lanes provided along the proposed arterial and collector streets and a multi-use trail with a Class I bike path provided along the San Joaquin River.

The Specific Plan's impact to bicycle facilities would be ***less than significant***.

PEDESTRIAN FACILITIES

Pedestrian access to the Project site is facilitated by concrete sidewalks and marked crosswalks along River Island Parkway and Barbara Terry Boulevard. Based on current plans, all street internal to the site will contain five-foot sidewalks or 15-foot trail (Street A). The Specific Plan does not physically disrupt an existing pedestrian facility. The proposed Project does not conflict with existing and planned pedestrian facilities; therefore, the impact to pedestrian facilities is ***less-than- significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.13-2: Implementation of the Project would not conflict with or be inconsistent with CEQA Guideline section 15064.3, subdivision (b). (Less than Significant)

As noted previously, SB 743 replaced LOS with VMT for purposes of assessing traffic impacts under CEQA, described in new Section 15064.3 of the CEQA Guidelines. Lead agencies have discretion to choose the most appropriate methodology to evaluate a project's VMT, including whether to express the change in absolute terms, per capita, per household or any other measure. VMT refers to the amount and distance of automobile travel "attributable to a project." The City of Lathrop adopted SB 743 Guidelines in September 2020.

PROJECT SCREENING

The City guidelines provide standards for identifying which types of projects should be expected to not result in a significant VMT impact, and a detailed CEQA analysis would not be required to evaluate the project VMT. Since this Project does not screen out, a full VMT analysis was conducted for the Project.

VMT FORECASTING

For VMT forecasting, the City of Lathrop SB 743 guidelines states that for a project to be VMT insignificant, the project has to generate 15 percent below the Citywide average for the total home-based residential VMT per capita statistic. As the City of Lathrop does not maintain its own travel demand model, the SJCOG 2018 RTP regional travel demand model was used to generate VMT statistics for the Project.

The Project site is located in traffic analysis zone (TAZ) #1751 of the SJCOG Model. Currently, TAZ #1751 contains five people and two households. The full Project buildout would add 912 households and 3,666 people (the people to household ratio of 4.02 was determined using Census data for the City of Lathrop). It is noted that the Specific Plan provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units / acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the following analysis is conservative as the number of units constructed at buildout would likely be closer to 829, as shown on the Vesting Tentative Subdivision Map.

A base year model run and a base year plus Project model run was conducted with the land use changes added. The VMT analysis for this Project assumes full buildout of the Project in the base year condition, which is a more conservative analysis since it assumes buildout of the entire Project at once, instead of the anticipated phased buildout through the forecast year of 2045. As such, the following analysis is conservative. The VMT results are summarized in Table 3.13-2.

TABLE 3.13-2: HOME-BASED VMT PER CAPITA COMPARISON (SAN JOAQUIN COUNTY REGIONAL AVERAGE)

TAZ	BASE YEAR AVERAGE DAILY HOME-BASED VMT PER CAPITA	CITYWIDE AVERAGE	15% BELOW CITYWIDE AVERAGE	BASE YEAR PLUS PROJECT AVERAGE DAILY HOME-BASED VMT PER CAPITA
#1751	17.28	18.17	15.44	16.45

SOURCE: TJMK, 2024.

The proposed Project's VMT contribution was assessed using the City of Lathrop's citywide average as its metric threshold. The existing base year home-based VMT per capita for TAZ #1751 is 17.28. Adding in the Project lowers the home-based VMT per capita for the TAZ to 16.45. As the citywide average for Lathrop for home-based VMT per capita is 18.17, the significance criteria (15 percent under the citywide average) would be 15.44. Without incorporating proposed features which would reduce VMT (discussed below), the Project's VMT per capita value of 16.29 is higher than the citywide threshold of 15.44.

The proposed Project design reflects many features that help reduce VMT (see Figures 2.0-7 and 2.0-8 in Chapter 2.0), such as:

- Pedestrian walkways provided along all local streets;
- Class II bike lanes provided along the proposed arterial and collector streets;
- A multi-use trail with a Class I bike path provided along the San Joaquin River; and
- Two bus stops along Town Centre Drive.

To ensure the Project would result in a VMT per capita which is below threshold, a decrease of 6.14 percent (or 1.01 VMT per capita) would be required for the Project. As part of the proposed Project, the improved pedestrian network which would include pedestrian walkways along all local streets and connect into the existing pedestrian network would reduce VMT up to 5.7 percent. Additionally, the Project design implements traffic calming measures and low stress bicycle facilities, including Class II bike lanes along the proposed arterial and collector streets and a multi-use trail along the San Joaquin River which would reduce VMT up to 1.7 percent. These Project design features would reduce VMT for the Project a total of 7.4 percent. With the proposed Project design features, the Project's VMT per capita would be more than 15 percent below the Citywide average for the total home-based residential VMT per capita statistic; therefore, impacts related to VMT would be ***less than significant***.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.13-3: Implementation of the Project would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). (Less than Significant)

The Project would be accessed by one intersection on River Island Parkway and two intersections on Barbara Terry Boulevard. All driveways will be full access. The Project's Bicycle and Pedestrian Map (see Figure 2.0-8 in Chapter 2.0) shows all proposed pedestrian facilities on the Project frontage and connectivity from River Island Parkway.

The proposed driveway locations, designs, and sight distances are expected to all be adequate. Additionally, future roadway improvements associated with buildout of the Specific Plan Area would be made in accordance with the City's Circulation Element and roadway functional design guidelines. The Project does not include any design features or uses that may cause traffic hazards such as sharp curves, tight turning radii from streets, limited roadway visibility, short merging lanes, uneven road grades, or any other conditions determined by the City engineer to be a hazard. Therefore, implementation of the proposed Project would have a ***less than significant*** impact relative to this topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

Impact 3.13-4: Implementation of the Project would not result in inadequate emergency access. (Less than Significant)

Emergency response requires a balance of emergency response time and evacuation needs with other community concerns, such as urban design and traffic calming. Future roadway improvements associated with buildout of the Specific Plan Area would be made in accordance with the City's Circulation Plan and roadway functional design guidelines.

The Specific Plan is designed to ensure that adequate emergency access is provided by providing two major points of ingress/egress to the development. The Specific Plan has a roadway network that is designed consistent with the City's General Plan, and it includes street sections that provide function and structure for the development. Each individual phase and/or site that is developed within the Specific Plan Area would be reviewed by the City to ensure that it is designed with adequate emergency access. Overall, implementation of the proposed Project would have a ***less than significant*** impact relative to this topic.

LEVEL OF SIGNIFICANCE BEFORE MITIGATION

Less than Significant

MITIGATION MEASURE(S)

None required.

This page left intentionally blank.

Legend

- Project Site
- Study Intersection
- Bus Stop
- Class II Bike Lane
- Bike Trail
- Marked Crosswalk
- Route 97
- Route 90

LATHROP MOSSDALE WEST

Figure 3.13-1. Existing Conditions - Pedestrian, Bicycle, and Transit Facilities

Source: TJKM, 01/2024. Map date: May 12, 2024

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

The California Environmental Quality Act (CEQA) requires an Environmental Impact Report (EIR) to evaluate a project's effects in relationship to broader changes occurring, or that are reasonably foreseeable to occur, in the surrounding environment. Accordingly, this chapter presents a discussion of CEQA-mandated analysis for cumulative impacts, significant irreversible effects, and significant and unavoidable impacts associated with the proposed Project.

4.1 CUMULATIVE SETTING AND IMPACT ANALYSIS

INTRODUCTION

CEQA requires that an EIR contain an assessment of the cumulative impacts that could be associated with the proposed Project. According to CEQA Guidelines Section 15130(a), “an EIR shall discuss cumulative impacts of a project when the project’s incremental effect is cumulatively considerable.” “Cumulatively considerable” is defined in CEQA Guidelines section 15065(a)(3) as meaning that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects” (as described in Section 15130). As defined in CEQA Guidelines Section 15355, a cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. A cumulative impact occurs from:

> *…the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.*

In addition, Section 15130(b) identifies that the following three elements are necessary for an adequate cumulative analysis:

1) Either:

    (A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or,

    (B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such document shall be referenced and made available to the public at a location specified by the lead agency.

2) A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and

3) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

CUMULATIVE SETTING

The cumulative setting uses growth projections listed in the City of Lathrop General Plan Draft EIR and Department of Finance statistics. Table 4.0-1 shows growth projections for the City, County, and State.

TABLE 4.0-1: GROWTH PROJECTIONS

Calendar Year	*Estimated Population (Lathrop)*	*Estimated Population (San Joaquin County)*	*Estimated Population (California)*
2025	35,475	829,426	39,024,054
2030	42,109	883,484	39,430,871
2040	58,969	1,020,862	40,106,449
2045	67,976	1,094,253	40,152,224

SOURCE: CITY OF LATHROP GENERAL PLAN EIR (2022); DEPARTMENT OF FINANCE REPORT P-1A (2023).

In addition to those cumulative growth projections listed above, this EIR uses a list of probable future projects to determine cumulative growth in the area. Development projects were identified by City of Lathrop staff. The approved and/or pending projects in the City are summarized in Table 4.0-2.

TABLE 4.0-2: CITY OF LATHROP EXISTING AND PROJECTED DEVELOPMENT (MAY 11, 2023)

Project Name	*Address*	*APN*	*SF Units*	*MF Units*	*Comm. SF*	*Ind. SF*
Approved and Constructed Development Projects						
Substantial Conformance - Starbucks - Approved 2021	16538 Golden Valley Pkwy.	191-760-14	-	-	2,400	-
Substantial Conformance - Chipotle - Approved 2020	16542 Golden Valley Pkwy.	191-760-15	-	-	2,300	-
Substantial Conformance - Sprouts - Approved 2021	N/A	191-760-22	-	-	23,000	-
Mossdale Apartments (Under Construction)	18007, 18149, and 18250 S. Manthey Rd.	241-020-65, -66, and -61	-	204	-	-
Phelan Lathrop Gateway - Phase I	3458 W. Yosemite Ave. and 18755 Business Park Ct.	241-820-03, and -04	-	-	-	990,350

PROJECT NAME	*ADDRESS*	*APN*	*SF UNITS*	*MF UNITS*	*COMM. SF*	*IND. SF*
Phelan Lathrop Gateway - Phase II	Various	241-820-09, and -11	-	-	-	890,375
Building 1 of South Lathrop Commerce Center	5120 Glacier St.	241-030-16	-	-	-	1,135,653
Building 3 of South Lathrop Commerce Center	5150 Glacier St.	241-030-18				920,402
Building 5, 6, and 7 of South Lathrop Commerce Center	5070, 5050, and 5030 W. Yosemite Ave.	241-030-20, -21, and -22				569,912
Panda Express	15099 Old Harlan Rd.	196-110-27	-	-	2,200	-
Tru by Hilton - 79-rooms	161 E. Louise Ave.	196-270-23	-	-	38,660	-
Golden Valley Self-Storage	16000 Golden Valley Pkwy.	191-200-27, -28, -29, and -30	-	-	152,000	
Towne Centre Apartments	240 Towne Centre Dr.	191-700-14	-	62	-	-
Towne Centre Apartments Phase 2	231 and 201 Towne Centre Dr.	191-550-74 and -75	-	84	-	-
Fairfield Inn - 90 rooms	N/A	191-760-02	-	-	50,458	-
Seefried Warehouse	18284 S. Harlan Rd.	198-130-64	-	-		189,000
RAD Urban Expansion	18231 Murphy Pkwy.	198-190-30	-	-	-	87,435
CFT Phase 2	15107 and 15135 Old Harlan Rd.	196-110-29 and -30	-	-	2,470	-
Duke Lathrop	16825 Murphy Pkwy.	198-210-19	-	-	-	346,860
Kraft Heinz	500 E. Louise	198-120-14	-	-	-	649,980
Chevron and Blue Rain Car Wash (Under Construction)	16460 and 16446 Golden Valley Pkwy.	192-040-47 and -48	-	-	9,413	-
		SUB-TOTALS	**0**	**350**	**282,901**	**5,779,967**
APPROVED AND PENDING CONSTRUCTION						
Multi-Entitlement - Lathrop Towne Centre	17100 Golden Valley Pkwy.	191-119-049	-	-	126,000	-
Multi-Entitlement - Lathrop Towne Centre - Hotel - 117 Rooms	17100 Golden Valley Pkwy.	191-119-049	-	-	60,000	-
Multi-Entitlement - North Crossroads Business Park - Remaining Buildings	500 and 1300 E. Louise Ave.	198-120-08 and 198-140-16	-	-	-	534,842
MSPR-19-52 - Lathrop Retail Building	15322 S. Harlan Rd.	196-110-19	-	-	7,848	-
Multi-Entitlement - Watt Commercial - Lathrop Market Place	N/A	191-760-02 thru -12, -16 thru 21	-	-	104,000	-
Phelan Lathrop Gateway - Phase III	Various	241-820-15	-	-	-	1,197,188
South Lathrop Commerce Center Remaining Buildings	Various	241-030-45, -19, -46, -47, and -23	-	-	-	2,125,187

PROJECT NAME	*ADDRESS*	*APN*	*SF UNITS*	*MF UNITS*	*COMM. SF*	*IND. SF*
McKinley Avenue Development	16300 S. McKinley Ave.	198-100-11	-	-	14,800	-
Scannell Properties Industrial Project	1520 Lathrop Rd.	198-040-14	-	-	-	191,160
Maverik Convenience Store & Fueling Facility	980 E. Lousie Ave.	198-120-11	-	-	5,951	-
HDC Properties (Cheema)	16190 and 16200 S. McKinley Ave.	198-100-12 and -13	-	-	22,200	-
TownePlace Suites by Marriott (97 rooms)	17400 Golden Valley Pkwy.	191-190-62	-	-	53,493	-
Lathrop Crossroads Industrial	1101 D'Arcy Pkwy.	198-130-54, -55, -57, and -58	-	-	-	448,904
Wendy's Lathrop	16412 Golden Valley Pkwy.	192-040-50	-	-	5,208	-
Ono Hawaiian BBQ	16434 Golden Valley Pkwy.	192-040-49	-	-	2,350	-
Home2Suites by Hilton (94 rooms) and Future Assisted Living Facility	15800 Golden Valley Pkwy.	192-040-19	-	-	68,565	-
		SUB-TOTALS	**0**	**-**	**470,415**	**4,497,281**
PENDING DEVELOPMENT PROJECTS - CURRENTLY PROCESSING APPLICATION(S)						
Hardeep Singh Truck Repair	18401 S. McKinley Ave.	241-400-28 and -27	-	-	7,500	-
Del Webb Community Center	Phase 2 of River Islands	-	-	-	13,829	-
River Islands Phase 1 Apartments	N/A	213-310-43	-	220	-	-
Escala at Stanford Crossing	400 Stanford Crossing	192-030-17	-	195	-	-
Ashley Furniture	14101 S. Manthey Rd.	192-020-14	-	-	-	1,486,607
		SUB-TOTALS	**0**	**415**	**51,843**	**1,486,607**
RESIDENTIAL DEVELOPMENT						
Building Permits Issued - SFD 2014	-	-	190	-	-	-
2015	-	-	343	-	-	-
2016	-	-	170	-	-	-
2017	-	-	297	-	-	-
2018	-	-	383	-	-	-
2019	-	-	389	-	-	-
2020	-	-	681	146	-	-
2021	-	-	957	172	-	-
2022	-	-	929	29	-	-
		SUB-TOTALS	**4,339**			

PROJECT NAME		*ADDRESS*	*APN*	*SF UNITS*	*MF UNITS*	*COMM. SF*	*IND. SF*
Projected Building Permits based on AVERAGE from 2015-2020. Not counted in **TOTALS** below.	2023	-	-	377	-	-	-
	2024	-	-	377	-	-	-
	2025	-	-	377			
	2026	-	-	377	-	-	-
	2027	-	-	377	-	-	-
			SUB-TOTALS	**1,885**			
Central Lathrop - Remaining Dwelling Units (based on the total number of dwelling units in Phase 1 (1,212) minus the total number of permits issued (as of 05.11.23).				254	-	-	-
River Islands Phase 1 - Remaining Dwelling Units (based on total number of dwelling units per Tract 3694 (4,284) minus the total number of permits issued (as of 05.11.23).				825	-	-	-
River Islands Phase 2 - Approved in June 2021 by City Council which will include development of 10,726 dwelling units. 698 Residential - High Units, 2,439 Mixed Use (Paradise Cut Village Center) and 1,821 Transit Oriented Development units assumed to be Apartments or HDR density.				5,768	5,258		
			SUB-TOTALS	**6,847**	**5,605**	**0**	**0**
			GRAND TOTAL	***11,186***	***6,020***	***805,159***	***11,763,855***

SOURCE: CITY OF LATHROP GENERAL PLAN EIR (2023).

CUMULATIVE EFFECTS OF THE PROJECT

Cumulative settings are identified under each cumulative impact analysis. Cumulative settings vary because the area that the impact may affect is different. For example, noise impacts generally only impact the local surrounding area because noise travels a relatively short distance, while air quality impacts affect the whole air basin as wind currents control air flow and are not generally affected by natural or manmade barriers which would affect noise. Cumulative proposed Project impacts are addressed and summarized below.

Method of Analysis

Although the environmental effects of an individual project may not be significant when that project is considered separately, the combined effects of several projects may be significant when considered collectively. State CEQA Guidelines 15130 requires a reasonable analysis of a project's cumulative impacts, which are defined as "two or more individual effects which, when considered together are considerable or which compound or increase other environmental impacts." The cumulative impact that results from several closely related projects is: the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (State CEQA Guidelines 15355[b]). Cumulative impact analysis may be less detailed than the analysis of the project's individual effects (State CEQA Guidelines 15130[b]).

There are two approaches to identifying cumulative projects and the associated impacts. The list approach identifies individual projects known to be occurring or proposed in the surrounding area in order to identify potential cumulative impacts. The projection approach uses a summary of projections in adopted General Plans or related planning documents to identify potential cumulative impacts. This EIR uses a combination of the list approach and the projection approach for the cumulative analysis and considers the development anticipated to occur upon buildout of the various General Plans in the area in addition to the pending projects in the area.

Project Assumptions

The proposed Project's contribution to environmental impacts under cumulative conditions is based on full buildout of the Specific Plan Area. See Chapter 2.0, Project Description, for a complete description of the proposed Project.

Cumulative Impacts

Some cumulative impacts for issue areas are not quantifiable and are therefore discussed in general terms as they pertain to development patterns in the surrounding region. Exceptions to this are traffic, utilities, noise, and air quality (the latter two of which are associated with traffic volumes), which may be quantified by estimating future traffic patterns, pollutant emitters, etc. and determining the combined effects that may result. In consideration of the cumulative scenario described above, the proposed Project may result in the following cumulative impacts.

AESTHETICS AND VISUAL RESOURCES

The cumulative setting for aesthetics is the City of Lathrop and surrounding areas of San Joaquin County.

Impact 4.1: Cumulative Damage to Scenic Resources within a State Scenic Highway (Less than Significant)

As described in Section 3.1, Aesthetics and Visual Resources, there are no designated State Scenic Highways in the vicinity of the Project site. The only Officially Designated Scenic Highway in San Joaquin County is I-580 from I-5 to SR 205 located approximately 13.6 miles southwest of the Project site. Views from this route are primarily agricultural with distant views of the Coast Range. The City of Lathrop and the Project site are not visible from this roadway segment.[1] There are no County designated scenic corridors, trails, or rivers located in the Project site. Additionally, there are no "eligible" highway segments in the Project vicinity that may be included in the State Scenic Highway system.

Cumulative development in the City would not impact a Designated Scenic Highway. Thus, cumulative impacts related to damage to scenic resources within a State Scenic Highway are ***less than significant***.

[1] California Department of Transportation, California State Scenic Highway System Map. Available at: https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed April 2024.

Impact 4.2: Cumulative Conflicts with the Applicable Zoning and Other Regulations Governing Scenic Quality (Less than Significant)

As described in Section 3.1, proposed Project would result in a land use consistent with the land use designation of the Project site. More specifically, the Project proposes the construction residential development. These improvements would be aesthetically similar to other suburban residential uses currently developed or anticipated within the immediate area and within the WSLP. The proposed residential development, in and of itself, would not substantially degrade the existing visual character or quality of the area and its surroundings, since uses would be similar to the urbanized uses near the proposed Project site. Therefore, while the Project would result in a loss of rural agricultural land, it would result in the development of residential uses in an area of Lathrop currently planned for and developed with similarly scaled uses.

Under cumulative conditions, buildout of the General Plans for Lathrop and the surrounding jurisdictions could result in changes to the visual character and quality of the City of Lathrop through development of undeveloped areas and/or changes to the character of existing communities. Development of the proposed Project, in addition to other future projects in the area, would change the existing visual and scenic qualities of the City. It is noted that although the Project site is undeveloped and was previously used for agricultural uses, the General Plan designates the site for Freeway Commercial uses. Additionally, the surrounding areas to the north, east, and south are designated for urban uses (including Freeway Commercial and Industrial uses) by the General Plan. The proposed General Plan amendment for the western portion of the site (from Agriculture/General [County] to Freeway Commercial [City]) would be processed as part of the proposed Project entitlements. Overall, the General Plan and associated EIR anticipated development of the area to the north, south, and east of the Project site for similar uses as proposed by the Project.

Development within the City would be required to be consistent with the General Plan policies and City Municipal Code, both of which cover aesthetics and visual characteristics. Further, the Municipal Code contains development standards that address the visual character of a development project, such as building height, massing, setbacks, lighting, and landscaping. Implementation of these requirements would reduce the impacts associated with development. As such, impacts relative to scenic quality would be ***less than significant***.

Impact 4.3: Cumulative Impact on Light and Glare (Less than Significant)

Implementation of the Specific Plan requirements and standards in conjunction with the Lathrop General Plan and municipal code standards for lighting would ensure that lighting features do not result in light spillage onto adjacent properties and do not significantly impact views of the night sky. Excessive reflective building materials would not be used on any buildings, structures, or facilities associated with the proposed Project. Furthermore, the landscaping on-site would include a variety of shade trees throughout the Project site, including large open park areas, and the perimeter of the site would be landscaped with a variety of grasses and trees. The proposed landscaping would assist in shielding glare resulting from the proposed development and glass windows. Therefore, the proposed Project is not expected to introduce significant glare that would negatively affect nearby pedestrians or motorists.

Future projects within Lathrop would be subject to the light and glare standards established by the individual jurisdictions. These regulations are designed to minimize potential light and glare impacts of new development. Implementation of these regulations would ensure that future projects minimize their potential light and glare impacts. For these reasons, cumulative impacts on nighttime lighting and daytime glare are ***less than significant***.

AGRICULTURAL RESOURCES

The cumulative setting for agricultural resources is all of San Joaquin County. San Joaquin County has a total land area of 1,391 square miles. The total acreage of crop land in the county is approximately 772,762 acres. The gross value of agricultural production in San Joaquin County for 2021 was $3,193,234,000 which represents a 5.0 percent increase ($162,605,000) in value from 2020.

Data from the Department of Conservation indicates that approximately 1,858 acres of Prime Farmland in the County was developed for other uses between 2016 and 2018, resulting in an existing total of 381,934 acres of Prime Farmland (42 percent of agricultural land). The remaining agricultural land is comprised of Farmland of Statewide Importance (9 percent), Unique Farmland (9 percent), Farmland of Local Importance (7 percent), and Grazing Land (14 percent).

Impact 4.4: Cumulative Impact on Agricultural Resources (Cumulatively Considerable and Significant and Unavoidable)

As described in Section 3.2, Agricultural Resources, development of the proposed Project would result in a conversion of 137.08 acres of Prime Farmland and 19.88 acres of Farmland of Statewide Importance, as shown on the map prepared under the Farmland Mapping and Monitoring Program (FMMP), to nonagricultural uses. The loss of Important Farmland as classified under the FMMP is considered a potentially significant environmental impact. Development under the proposed Project inherently involves the conversion of high-quality agricultural land. Mitigation Measure 3.2-1 requires participation in the City's Agricultural Mitigation Fee Program. While the implementation of this mitigation measure would assist in preserving farmland, the proposed Project would still result in the permanent conversion and loss of approximately 137.08 acres of Prime Farmland and 19.88 acres of Farmland of Statewide Importance within San Joaquin County.

The entire Plan Area falls under the Williamson Act and will require existing contracts to go through the process of cancellation and non-renewal. The Williamson Act cancellation process cannot occur until after the properties are annexed to the City of Lathrop.

Cancellation of the Williamson Act is provided in Sections 51240-51287 of the Government Code. The state law requires those who wish for non-renewal, to file a Notice of Non-Renewal signifying intent to not renew the contract and file a petition for cancellation with the Lathrop City Council. The Lathrop City Council must find that the cancellation is consistent with the purposes of the

Williamson Act and furthers public interest to approve the cancellation. Once approved, the land may continue to be used for agricultural purposes up until the development of land requires discontinuation.

The Plan Area is designated as Low Density Residential (LD) by the City's General Plan Land Use Map and is zoned as RL-MV (Low Density Residential, Mossdale Village Combining District) and P-MV (Public Schools Parks Open Space, Mossdale Village Combining District) by the City's Zoning Map. The proposed Project will include a rezone from RL-MV and P-MV to RL-MV, P-MV (Park, Mossdale Village Combining District), and OS-MV (Open Space, Mossdale Village Combining District). As such, the Project site is not zoned for agricultural use, and land zoned for agricultural use is not located in the Project vicinity. The proposed Project would not conflict with existing zoning for agricultural use.

In addition to impacts related to Williamson Act Contracts and agricultural land and zoning, the proposed Project would result in the permanent conversion and loss of approximately 137.08 acres of Prime Farmland and 19.88 acres of Farmland of Statewide Importance within San Joaquin County. For these reasons, cumulative impacts related to agricultural resources would be significant, and the proposed Project's contribution to those impacts would be ***cumulatively considerable*** and ***significant and unavoidable***.

AIR QUALITY

The cumulative setting for air quality impacts is the San Joaquin Valley Air Basin (SJVAB), which consists of eight counties, stretching from Kern County in the south to San Joaquin County in the north. The SJVAB is bounded by the Sierra Nevada in the east, the Coast Ranges in the west, and the Tehachapi mountains in the south.

Impact 4.5: Cumulative Impact on the Region's Air Quality (Less than Significant)

Under buildout conditions in San Joaquin County, the SJVAB would continue to experience increases in criteria pollutants. San Joaquin County has a State designation Attainment or Unclassified for all criteria pollutants except for ozone, respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$). San Joaquin County has a national designation of either Unclassified or Attainment for all criteria pollutants except for Ozone and $PM_{2.5}$. Table 3.3-2 in Section 3.3 presents the State and Federal attainment status for San Joaquin County.

As discussed under Impact 3.3-1 in Section 3.3, Air Quality, the proposed Project would result in increased emissions. The San Joaquin Valley Air Pollution Control District (SJVAPCD) has established operations related emissions thresholds of significance. As shown in Table 3.3-8 of Section 3.3, the unmitigated operational emissions would not exceed the SJVACPD operational thresholds of significance for any of the criteria air pollutants.

The proposed Project is subject to the SJVAPCD Rule 9510 (Indirect Source Rule [ISR]), which could result in substantial mitigation of NO_X and associated ROG emissions. The reductions are accomplished by the incorporation of mitigation measures into projects and/or by the payment of an Indirect Source Rule fee for any required reductions that have not been accomplished through

Project mitigation commitments. The actual calculations will be determined and finalized by the SJVAPCD and Project applicants as individual projects are brought forward for approval under Rule 9510.

The substantial reductions in NO_X (and associated ROG) and PM_{10} emissions accomplished by the application of the ISR represent the best achievable mitigation for indirect sources. For these reasons, cumulative impacts on the loss of biological resources are ***less than significant***.

BIOLOGICAL RESOURCES

The cumulative setting for biological resources includes the Specific Plan Area and the greater San Joaquin County region. Development associated with implementation of the local General Plan(s) would contribute to the ongoing loss of natural and agricultural lands in San Joaquin County, including the Specific Plan Area. Cumulative development would result in the conversion of existing habitat to urban uses. The local General Plan(s), in addition to regional, State, and federal regulations, includes policies and measures that mitigate impacts to biological resources associated with General Plan buildout.

Impact 4.6: Cumulative Loss of Biological Resources Including Habitats and Special-Status Species (Less than Significant)

Under cumulative conditions, buildout of the General Plan(s) within San Joaquin County will result in impacts to biological resources in the cumulative area through new and existing development. The General Plan(s) includes policies that are designed to minimize impacts to the extent feasible.

As described in Section 3.4, Biological Resources, construction in the Project site has the potential to result in impacts to special-status species in the region. The Project site provides potential habitat for several species, including those discussed in Section 3.4. All biological resources impacts were determined to have no impact, be less-than-significant, or less-than-significant with mitigation.

Mitigation Measures 3.4-1, 3.4-2, and 3.4-3 require the Project applicant to conduct preconstruction surveys and avoid or minimize impacts to special status bumble bees and obtain coverage under the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP) to mitigate for habitat impacts to covered special status species. As part of Mitigation Measure 3.4-2, compensatory mitigation for habitat impacts on covered species through implementation of incidental take and minimization Measures (ITMMs) and payment of fees for conversion of lands that may provide habitat for covered special status species.

The Project would result in impacts to biological resources including habitats and special status species. The City has evaluated urban development in the Project area through the General Plan process, and subsequently determined that urban development in this location is appropriate. The proposed project, when considered alongside all past, present, and probable future projects (inclusive of buildout of the various General Plans within San Joaquin County), would not be expected to cause any significant cumulative impacts. Implementation of the regulations contained in the SJMPSCP and the various General Plans within San Joaquin County would ensure that future projects minimize their potential biological resources. For these reasons, cumulative impacts on the loss of biological resources are ***less than significant***.

CULTURAL AND TRIBAL RESOURCES

The geography of cultural and tribal resources impacts can be defined by region, by political subdivision, or by the geography of the cultural resources present in an area, where sufficient inventory data is available to define it. The cumulative setting for cultural and tribal resources includes all of San Joaquin County. There are extensive cultural sites located in the region.

Impact 4.7: Cumulative Impacts on Known and Undiscovered Cultural and Tribal Resources (Less than Significant)

Cumulative development anticipated in the City of Lathrop, including growth projected by adopted future projects, may result in the discovery and removal of cultural resources, including archaeological, paleontological, historical, and Native American resources and human remains. Each individual project is subject to review under CEQA and is required to obtain necessary permits and approvals from federal and state resource agencies. As a result of these processes, each project would be required to avoid, minimize, and compensate for its impacts on sensitive cultural resources, such that the cumulative impact would be reduced, though not completely eliminated. Because not all such impacts from these other projects have been or can be reduced with certainty to less-than-significant levels, the loss of any cultural or tribal cultural resources would result in a potentially significant cumulative impact.

The Cultural Resources Assessment concluded that there is a possibility that the Project site possesses the potential to contain previously unrecorded prehistoric and/or historic era cultural resources. There is no indication that the Project site contains human remains; however, the possibility cannot be entirely discounted. The discovery of previously unknown archaeological resources or human remains, including those that could qualify as tribal cultural resources, is possible given the history of the area.

Implementation of Mitigation Measures 3.5-1, 3.5-2 and 3.5-3 in Section 3.5 would establish protocols for the avoidance and safe handling of any cultural and tribal cultural resources encountered during implementation of the proposed Project. With implementation of these Project-level mitigation measures, the proposed Project’s impact would be ***less than significant***.

GEOLOGY AND SOILS

Impacts related to geology and soils are not inherently cumulative. Geology and soils concerns are related to risks, hazards or development constraints that are largely site-specific. However, seismic hazards are regional, and management of seismic hazards is vested with the local planning and building authority. For these reasons, the potential for cumulative geology and soils impacts are considered in the context of the City of Lathrop and vicinity.

Impact 4.8: Cumulative Impact on Geologic and Soils Resources (Less than Significant)

Seismic Hazards: Potentially adverse environmental effects associated with seismic hazards are usually site-specific and generally do not result in cumulative effects. Cumulative projects could be exposed to considerable ground shaking during seismic events, but the development of individual projects would not increase the potential for impacts to occur. Individual development proposals within the vicinity of the Project site would be reviewed separately by the appropriate public agency (i.e., City or County) and undergo environmental review if appropriate. In the event that future cumulative development would result in impacts related to geologic or seismic impacts, those potential project or site-specific impacts would be addressed in accordance with the requirements of CEQA. New buildings would be constructed utilizing current design and construction methodologies for earthquake resistant design as required by relevant regulations. Thus, the cumulative impact regarding strong seismic ground shaking or seismic-related ground failure, including liquefaction, would be ***less than significant***.

Soil Erosion: Potentially adverse environmental effects associated with topographic alteration and erosion are usually site-specific and generally do not result in cumulative effects. Development of the proposed Project and cumulative projects would involve some land clearing, mass grading, and other ground-disturbing activities that could temporarily increase soil erosion rates during and shortly after project construction. Site specific geology and soil conditions would be evaluated on a project-by-project basis, and each project would be required to comply with stormwater runoff and pollution control requirements required by the RWQCB and implemented by the specific jurisdiction in which the development occurs. Construction activities for projects in the City would also be subject to the City's Stormwater Management and Discharge Control Ordinance. The existing regulatory environment would reduce potential impacts associated with soil erosion or the loss of topsoil during short-term construction activities and long-term operation of individual and cumulative development projects. Thus, the cumulative impact to soil erosion or the loss of topsoil would be ***less than significant***.

Unstable or Expansive Soils: Potentially adverse environmental effects associated with seismic hazards, as well as those associated with expansive soils, topographic alteration, and erosion, are usually site-specific and generally do not result in cumulative effects. Cumulative projects could be exposed to considerable ground shaking during seismic events, but the development of individual projects would not increase the potential for impacts to occur. Individual development proposals within the vicinity of the Project site would be evaluated on a project-by-project basis and by the appropriate public agency (i.e., City or County) and undergo environmental review if appropriate. In the event that future cumulative development would result in impacts associated with unstable geologic units or soils, those potential project or site-specific impacts would be addressed in accordance with the requirements of CEQA. New buildings would be constructed utilizing current design and construction methodologies as required by relevant regulations. Thus, the cumulative impact involving a geologic unit or soil that is unstable, potentially resulting in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse, would be ***less than significant***.

Potentially adverse environmental effects associated with expansive soils, topographic alteration, and erosion, are usually site-specific and generally do not result in cumulative effects. Individual development proposals within the vicinity of the Project site would be evaluated on a project-by-project basis and by the appropriate public agency (i.e., City or County) and undergo environmental review if appropriate. In the event that future cumulative development would result in impacts associated with expansive soils, those potential project or site-specific impacts would be addressed in accordance with the requirements of CEQA. New buildings would be constructed utilizing current design and construction methodologies as required by relevant regulations. Thus, the cumulative impact involving expansive soils, creating substantial direct or indirect risks to life or property would be ***less than significant***.

<u>Paleontological Resources</u>: Any project involving earth-moving activity could potentially result in inadvertent discovery and disturbance of paleontological resources during grading and excavation work; these inadvertent discoveries could create potentially-significant impacts.

As previously mentioned, the General Plan EIR included a search of the database of the UCMP Collections, which identified 80 fossils that have been found and recorded within San Joaquin County. The majority of fossils found within the Lathrop area have been vertebrate in nature. These fossils include mammoth/mastodon, horse, pocket gopher, and other unspecified rodents, and unidentified artiodactyl (hoofed mammal) bone. Future ground disturbing activities associated with Project implementation and cumulative projects could have potential to cumulatively impact paleontological resources, and the Project would have a cumulatively considerable contribution to that impact. However, all development, infrastructure, and other ground-disturbing projects in the City, including the Project, would be required to comply with the General Plan, including Recreation and Resources Element Action RR-3d. Compliance with applicable City regulations would ensure that cumulative impacts associated with paleontological resources or unique geologic features are ***less than significant***.

GREENHOUSE GASES, CLIMATE CHANGE, AND ENERGY

As the California Supreme Court has reasoned, “because of the global scale of climate change, any one project's contribution is unlikely to be significant by itself. The challenge for CEQA purposes is to determine whether the impact of the project’s emissions of greenhouse gases is cumulatively considerable, in the sense that ‘the incremental effects of [the] individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.’” (*Center for Biological Diversity v. California Department of Fish and Wildlife* (2015) 62 Cal.4th 204, 219.) “‘With respect to climate change, an individual project's emissions will most likely not have any appreciable impact on the global problem by themselves, but they will contribute to the significant cumulative impact caused by greenhouse gas emissions from other sources around the globe. The question therefore becomes whether the project's incremental addition of greenhouse gases is “cumulatively considerable” in light of the global problem, and thus significant.’” (*Ibid*.)

The cumulative setting for analysis of greenhouse gas emissions and climate change impacts for this analysis is San Joaquin County, which is the boundary for the California Air Resources Board's regional greenhouse gas emissions reduction targets.

Impact 4.9: Cumulative Impact on Climate Change from Increased Project-Related Greenhouse Gas Emissions (Less than Cumulatively Considerable)

Greenhouse gas emissions from a single Project will not cause global climate change; however, greenhouse gas emission from multiple projects throughout a region or state could result in a cumulative impact with respect to global climate change.

In California, there has been extensive legislation passed with the goal of reducing greenhouse gas emissions. The legislative goals are as follows: 1) 2000 levels by 2010, 2) 1990 levels by 2020 and 3) 40 percent below the 1990 levels by the year 2030. Executive Orders issued by recent Governors have identified even more aggressive targets: 1) 80 percent below 1990 levels by 2050; and 2) carbon neutrality by 2045. To achieve these goals, the CARB has developed regional greenhouse gas emission reduction targets for the automobile and light truck sectors (the largest single source of greenhouse gas emissions) for 2020 and 2035. The regional greenhouse gas emission reduction targets for each region in California were established by the California Air Resources Board.

As described in Impact 3.7-1 in Section 3.7, implementation of the proposed Project would generate GHG emissions that would not otherwise exist without the proposed Project, although, as the California Supreme Court has said, "the future residents and occupants of development enabled by Project approval would exist and live somewhere else if this Project is not approved. Whether 'here or there,' GHG emissions associated with such population growth will occur." (*Center for Biological Diversity v. California Department of Fish and Wildlife* (2015) 62 Cal.4th 204, 219.)

The proposed Project, however, would not conflict with any of the GHG reduction measures contained with the CARB's 2022 Scoping Plan Update and the SJCOG's 2022 RTP/SCS. Therefore, the proposed Project would be consistent with the State GHG reduction targets, and would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment or to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The City therefore concludes that the proposed Project would be doing its fair share to reduce GHG emissions consistent with state climate objectives and emissions reduction targets. Thus, although the cumulative impacts from worldwide, statewide, regional, and countywide GHG emissions are cumulatively significant, the incremental contribution to those significant impacts from the proposed Project would be ***less than cumulatively considerable***.

HAZARDS AND HAZARDOUS MATERIALS

The cumulative context for the analysis of cumulative hazards and human health impacts is San Joaquin County, including all cumulative growth therein, as represented by full implementation of each respective General Plan (i.e., Lathrop, Stockton, San Joaquin County, etc.).

Impact 4.10: Cumulative Impacts Related to Hazards and Hazardous Materials (Less than Significant)

Routine Transport, Use, or Disposal of Hazardous Materials: Construction activities associated with future development projects may involve the routine transport, use, or disposal of hazardous materials. However, the construction contractor would be required to use standard construction controls and safety procedures that would avoid and minimize the potential for hazards associated with the transport and use of hazardous materials. Standard construction practices would be observed such that any materials released are appropriately contained and remediated as required by local, State, and federal law.

Existing and future uses within the City are likely to use, store, transport, and dispose of hazardous materials. Residential and commercial uses do not typically involve the use or storage of hazardous substances other than limited quantities of hazardous materials such as solvents, fertilizers, pesticides, and other materials used for regular maintenance of buildings and landscaping. The quantities of these materials would not typically be at an amount that would pose a significant hazard to the public or the environment. Industrial uses may involve the use, generation, storage, or transport of larger amounts of hazardous materials. The use, storage, transport, and disposal of hazardous materials would be governed by existing regulations of several agencies, including the DTSC, EPA, DOT, Cal OSHA, and the CUPA. Adherence to existing regulations would ensure compliance with safety standards related to the use and storage of hazardous materials, and the safety procedures mandated by applicable federal, State, and local laws and regulations, which would ensure that risks involving the routine transportation, use, storage, or disposal of hazardous materials or hazardous wastes would be cumulatively ***less than significant***.

Release of Hazardous Materials into the Environment: Future development sites within the City and vicinity of the Project site could create a significant hazard to the public or the environment through upset and accident conditions involving the release of hazardous materials into the environment. Construction activities associated with Project implementation and cumulative development projects could involve demolition, grading, excavation, and other ground-disturbing activities that could temporarily create a significant hazard to the public or the environment through release of hazardous materials. Future site-specific development would be reviewed at the project-level to determine whether any development sites are listed on a hazardous materials site. Any development activities that may occur on documented hazardous materials sites would be required to undergo remediation and cleanup under the supervision of the regulatory agencies, such as DTSC and the RWQCB. Therefore, the cumulative impact of creating a hazard to the public or environment through reasonably foreseeable accident would be less than significant.

<u>Emit or Handle Hazardous Emissions or Materials within 1/4 mile of an Existing or Proposed School</u>: Future development projects would be evaluated at the project-level to determine whether any development sites are located within one-quarter mile of an existing or proposed school. All future use, storage, transport, and disposal of hazardous materials associated with the proposed Project and cumulative development projects would be governed by existing regulations of several agencies, including the DTSC, EPA, DOT, Cal OSHA, and the CUPA. Site-specific development would adhere to standard construction practices which determines that any hazardous materials released are to be appropriately contained and remediated as required by local, State, and federal law. Compliance with applicable laws and regulations governing the use, storage, transportation, and disposal of hazardous materials would ensure all potentially hazardous materials are used and handled in an appropriate manner and would minimize the potential for safety impacts. All cumulative development projects would be required to adhere to existing regulations which ensure compliance with safety standards related to the use and storage of hazardous materials, and the safety procedures mandated by applicable federal, State, and local laws and regulations would reduce potential impacts to schools within the area. Therefore, the cumulative impact involving emission of hazardous materials within a one-quarter mile of a school would be ***less than significant***.

<u>Government Code Section 65962.5</u>: Future development projects would be evaluated at the project-level to determine whether any development sites are listed on a hazardous materials site. Any development activities occurring on documented hazardous materials sites would be required to undergo remediation and cleanup under the supervision of federal, State, and local regulations, including the DTSC and the RWQCB, prior to construction. Therefore, the cumulative impact of locating development on hazardous materials sites would be ***less than significant***.

<u>Safety Hazard Relating to Airports</u>: Future development projects would be evaluated at the project-level to determine if they are located within an airport land use plan or within two miles of a public or public use airport. Future projects located within the airport influence area for the Stockton Metropolitan Airport or other County airports would be reviewed by the Airport Land Use Commission for consistency with applicable standards established in the ALUCP on a project-by-project basis. Therefore, the cumulative impact of locating cumulative development in an airport land use plan area would be ***less than significant***.

<u>Emergency Response Plan or Emergency Evacuation Plan</u>: Future development projects could impair implementation of or physically interfere with an adopted emergency response plan. Construction activities associated with Project implementation and cumulative development projects could involve demolition, grading, excavation, and other ground-disturbing activities that could temporarily interfere with emergency response plans or emergency evacuation plans. Future development would be designed, constructed, and maintained in accordance with applicable standards, including vehicular access to ensure that adequate emergency access and evacuation would be maintained. Access for emergency vehicles would be required to be incorporated into project design. Construction activities that may temporarily restrict vehicular traffic would be required to implement appropriate measures to facilitate the passage of persons and vehicles

through/around any required road closures. Future development projects would be required to comply with applicable City codes and regulations pertaining to emergency response and evacuation plans. Prior to construction, proposed site plans would be required to undergo review by the LMFD to ensure that adequate emergency access would be maintained within the area. During operation of future projects, the EOP would be implemented and emergency response and evacuation would occur dependent upon the emergency situation, consistent with the EOP. Therefore, the cumulative impact to emergency response would be ***less than significant***.

HYDROLOGY AND WATER QUALITY

Potential cumulative issues associated with surface waters can be addressed on a watershed basis, or in the case of groundwater, in the context of a groundwater basin. Because water resources are highly interconnected, the cumulative setting is based on San Joaquin County which is located in the San Joaquin River Hydrological Region. Cumulative development in this region, including the proposed Project, would impact the water quality and hydrological features of the San Joaquin River Hydrologic Region. The City of Lathrop and much of the surrounding area is located in the San Joaquin Valley Groundwater Basin. The Project site is located in the San Joaquin River watershed.

Impact 4.11: Cumulative Increases in Peak Stormwater Runoff from the Specific Plan Area (Less than Significant)

Implementation of the proposed Project would increase the amount of impervious surfaces in the Specific Plan Area, which could increase peak stormwater runoff rates and volumes on and downstream of the Specific Plan Area. However, the proposed Project includes an extensive system of on-site stormwater collection facilities to accommodate the increased stormwater flows that would originate in the Specific Plan Area.

The proposed stormwater collection system functions through storm drainage collection, treatment, detention, and discharge. The exact sizing of the underground piping and basin will be engineered during the preparation of the improvement plans. The collection of rainwater for those areas of impervious surfaces will be routed into the proposed Project's storm drainage system. Stormwater would be gravity fed and eventually flow to the proposed retention basin. Once at the retention basin, water would percolate to underground groundwater stores. The detention basin will be designed with surface areas and volumes in compliance with City standards. The same is true of other foreseeable development in the County, which would similarly be bound to comply with strict federal, state, and local laws and regulations. For example, present and probable future development projects in the City would be required to comply with the City's stormwater runoff regulations, including but not limited to those found in the City's Post-Construction Standards Plan, Post-Construction Standards Plan, and Municipal Code. With the design and construction of improvements included in the proposed storm drainage system, the proposed Project would not increase peak stormwater runoff. The proposed Project, when considered alongside all past, present, and probable future projects (inclusive of buildout of the various General Plans within San Joaquin County), would not be expected to cause any significant cumulative impacts given that mitigation measures would control peak stormwater runoff. The proposed Project would not have cumulatively considerable impacts associated with stormwater runoff. Overall, implementation of the proposed project would have a ***less than significant*** cumulative impact to stormwater runoff.

Impact 4.12: Cumulative Impacts Related to Degradation of Water Quality (Less than Cumulatively Considerable)

The proposed Project, along with several of the related projects within the City of Lathrop, would ultimately discharge stormwater runoff to detention basins, the City's system of laterals, the San Joaquin River, or the groundwater basin. This would potentially degrade the water quality of the system. In the regional vicinity of the Project Area, San Joaquin River are listed as Category 5 waterbodies. The criteria for a Category 5 waterbody include a water segment where standards are not met and a TMDL is required, but not yet completed, for at least one of the pollutants being listed for this segment. The San Joaquin River (Lower) assessed waterbody includes 59 acres listed as early as 1998 for Chlorpyrifos (Agriculture, Urban Runoff/Storm Sewers), Diazinon (Agriculture, Urban Runoff/Storm Sewers), Group A Pesticides (Agriculture), Mercury (Resource Extraction), Temperature, water (Source Unknown), and Unknown Toxicity (Source Unknown). The Dry Creek (tributary to Tuolumne River at Modesto, E San Joaquin County) assessed waterbody includes 34 acres listed as early as 2010 for Chlorpyrifos (Agriculture, Urban Runoff/Storm Sewers), Diazinon (Agriculture, Urban Runoff/Storm Sewers), Group A Pesticides (Agriculture), Mercury (Resource Extraction), Temperature, water (Source Unknown), and Unknown Toxicity (Source Unknown).

Construction of the proposed Project would contribute to a cumulative increase in urban pollutant loading, which could adversely affect water quality. Cumulative development in the Lathrop area, including the proposed Project, would also result in increased impervious surfaces that could increase the rate and amount of runoff, thereby potentially adversely affecting existing surface water quality through increased erosion and sedimentation. The primary sources of water pollution include: runoff from roadways and parking lots; runoff from landscaping areas; non-stormwater connections to the drainage system; accidental spills; and illegal dumping. Runoff from roadway and parking lots could contain oil, grease, and heavy metals; additionally, runoff from landscaped areas could contain elevated concentrations of nutrients, fertilizers, and pesticides.

The Project applicant would be requires the development and approval of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will include BMPs to regulate stormwater quality for the Specific Plan Area which will be designed in accordance with the National Pollutant Discharge Elimination System Permit (NPDES) Stormwater Program. The City of Lathrop adopted a Low Impact Development Design and Specifications Manual to assist developers in meeting State and local mandates for storm water drainage. The storm drain system will be designed consistent with the LID requirements of the City of Lathrop. Storm drainage will be provided to the Plan Area through the installation of a storm drain mains, basins, and pump stations.

Compliance with City and County water quality protection regulations, approval from the RWQCB, and SWPPP would ensure that the proposed Project minimizes impacts to surface water quality. Additionally, the proposed Project will conform to and utilize the LID practices set forth by the City of Lathrop.

Nevertheless, because the San Joaquin River is a Category 5 impaired water body, cumulative impacts relating to water quality degradation as a result of past, present, and probable future projects will be potentially significant. However, because much of the proposed Project is designated for urban development by the City's General Plan, and the proposed Project includes an extensive network of water quality control measures, the proposed Project's incremental contribution to this impact will be ***less than cumulatively considerable***.

Impact 4.13: Cumulative Impacts Related to Degradation of Groundwater Supply or Recharge (Less than Significant)

The proposed Project would result in new impervious surfaces and could reduce rainwater infiltration and groundwater recharge. Infiltration rates vary depending on the overlying soil types. In general, sandy soils have higher infiltration rates and can contribute to significant amounts of ground water recharge; clay soils tend to have lower percolation potential; and impervious surfaces such as pavement significantly reduce infiltration capacity and increase surface water runoff.

The Project Area has soils with hydrologic ratings of "C". Group "C" soils have moderately high runoff potential when thoroughly wet. Development of the Project Area with impervious surfaces could reduce rainwater infiltration and groundwater recharge further. The collection of rainwater for those areas of impervious surfaces will be routed into the proposed Project's storm drainage system and eventually flow into the San Joaquin River or other downstream aquatic facilities.

As detailed in the City's 2020 UWMP and mentioned previously in this section, the City's groundwater wells are located in the Tracy Subbasin and the City is part of Tracy Subbasin GSA. The City was a part of the development of the GSP for the Tracy Subbasin in 2021. Based on the GSP for the Tracy Subbasin, and statements in the 2020 UWMP, the City's groundwater supplies are expected to be highly reliable.

As detailed in the City's 2020 UWMP and mentioned previously in this section, the City's groundwater wells are located in the Tracy Subbasin and the City is part of Tracy Subbasin GSA. The City was a part of the development of the GSP for the Tracy Subbasin in 2021. Based on the GSP for the Tracy Subbasin, and statements in the 2020 UWMP, the City's groundwater supplies are expected to be highly reliable.

As discussed in Section 3.15, Utilities and Service Systems, of the City's General Plan Draft EIR, the City's 2020 UWMP documents current and projects future water demands and supplies through 2040. Water supplies to meet future demands include surface water purchased from SSJID, City produced groundwater and recycled water. The City's water supply is projected to increase by about 54 percent from 2020 to 2040, primarily due to implementation of the City's UMWP. Future City groundwater pumping is estimated based on the safe yield for all groundwater pumping within the City's planning area which is not predicted to experience any additional restrictions as a result of the City's GSP.

The City plans to utilize its existing groundwater wells to supply water in the future. As discussed in the City's UWMP, the current estimated annual groundwater yield is 4,720 AFY and the City currently has no plans to install additional groundwater wells or expand its groundwater production. Additionally, as described in the UWMP the City's ability to utilize groundwater wells will not be impacted by groundwater levels within the Tracy groundwater basin, and would not require the City to limit groundwater production to maintain a sustainable groundwater budget. Based on the available information, it is anticipated that 100% the City's current estimated groundwater yield is available for the planning horizon.

Further, as noted in the GSP, each member City, including Lathrop, includes policies within the General Plan to further encourage water conservation and overall water system efficiency.

The proposed Project would not be required to build new municipal water wells to increase capacity of available water.

For the reasons mentioned above, the GSP should ensure that the cumulative impacts of the proposed Project, together with other past, present, and probable future projects within the Tracy Subbasin, would not cause the substantial depletion of groundwater supplies or interfere substantially with groundwater recharge. Such cumulative impacts, then, would be ***less than significant***.

Impact 4.14: Cumulative Impacts Related to Flooding (Less than Significant)

As shown on Figure 3.9-2, the Development Area is not within the 100- or 500-year flood hazard zones. While portions of the Project site outside of the Development Area are located in the 100-year flood zone, these portions would be open space as part of the Project. Development of urban uses within the 100-year flood zone would not occur as a result of the Project. As noted previously, the Project site is within Zone X, Area with Reduced Risk Due to Levee.

The majority of the Project site is located in the 200-year floodplain. However, pursuant to the City Municipal Code, the proposed Project would be required to comply with regulations contained in Chapter 17.17 (200-Year Flood Protection) of the City Municipal Code.

While the Development Area is located within the dam failure inundation area for the Don Pedro Dam, the proposed Project is not anticipated to result in the exposure of people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, seiche, tsunami, or mudflow. The potential for dam failure is extremely low. Furthermore, the implementation of the proposed project does not exacerbate existing environmental hazards or, in other words, increase the likelihood of dam failure.

The ongoing operational phase of the proposed project requires the eventual discharge of stormwater into the San Joaquin River. The discharge of stormwater must be treated through BMPs prior to its discharge. The Lathrop Municipal Code provides rules and regulations to manage and control stormwater and discharge (Chapter 13.28). Section 13.28.120 requires compliance with all applicable NPDES permits. Additionally, Section 13.28.130 specifically provides requirement to prevent, control, and reduce stormwater pollutants. This includes requirements to implement BMPs to the extent they are technologically achievable to prevent and reduce pollutants. Under this requirement, project proponents must sign an O&M agreement in which they legally bind themselves to maintain the installed post-construction design measures in an effective and good operational condition until the property ownership is transferred. A written O&M plan for the proposed stormwater design measures is required to be submitted to and approved by the city with the signed agreement. The agreement will be recorded with the deed by the county clerk making it transferrable to the new owner; or, when there are multiple property owners responsible for the maintenance of the control measures, the agreement will consist of a legally binding covenant between the city and the homeowners association or maintenance district. The owner or association responsible for the maintenance of the control measures may be required by the city to submit an annual self-certification that the stormwater control measures are effective and are being maintained in accordance with the submitted and approved O&M plan.

The ongoing operational phase of the proposed Project requires the final discharge of stormwater into the San Joaquin River. The discharge of stormwater must be treated through BMPs prior to its discharge. The City of Lathrop implements BMPs to the extent they are technologically achievable to prevent and reduce pollutants.

In accordance with the Mossdale Landing Master Drainage Plan, City's Storm Water Master Plan (SWMP), and NPDES General Permit for Stormwater Discharges from Small MS4s, BMPs would be implemented to reduce the amount of pollution in stormwater discharged from the project site. The management of water quality through the implementation of appropriate BMPs would ensure that water quality does not degrade to levels that would violate water quality standards.

Future development within the City of Lathrop must be sited and designed in accordance with the aforementioned City flood damage regulations (i.e., Chapter 13.28 of the City Municipal Code). The proposed Project, when considered alongside all past, present, and probable future projects (inclusive of buildout of the various General Plans within San Joaquin County), would not be expected to cause any significant cumulative impacts given that mitigation measures for new development projects require designs that ensure structures are outside the base flood elevation and that storm water flows are maintained to prevent downstream flooding.

Through compliance with these existing regulations, implementation of the proposed Project would have a ***less than significant*** cumulative impact relative to this environmental topic.

LAND USE, POPULATION, AND HOUSING

The cumulative setting for land use and population impacts is the City of Lathrop.

Impact 4.15: Cumulative Impact on Communities and Local Land Uses (Less than Significant)

Cumulative land use impacts, such as the potential for conflicts with adjacent land uses and consistency with adopted plans and regulations, are typically site- and Project-specific. Prior to Project authorization, City approval of the proposed Project would require approval of a General Plan amendment to change land uses in the Project Area to very specifically fit the design concept.

The land uses as proposed are not consistent with the General Plan. When land uses are not consistent with a General Plan there are two courses of action: 1) the uses are not allowed due to the inconsistency, or 2) the land uses are changed through an amendment to the General Plan to create consistency. The proposed Project will include a General Plan Amendment from LD to LD, Park (P), and Open Space (O). Approval of the General Plan amendment would ensure that the proposed Project would be substantially consistent with the Lathrop General Plan land use requirements.

The Project is consistent with most of the applicable General Plan policies that aim to avoid or mitigate an environmental effect. Approval of the General Plan amendment would ensure that the proposed Project would be substantially consistent with the Lathrop General Plan land use requirements and would have a ***less than cumulatively considerable*** impact relative to the Lathrop General Plan. It is noted that consistency with Lathrop General Plan policies and programs related to environmental topics other than land use (aesthetics, agricultural resources, biological resources, cultural resources, geology/soils, hazards, hydrology/water quality, noise, public services, transportation, and utilities) are discussed in the relevant sections of this EIR.

The Lathrop Zoning Code implements the General Plan. The proposed Project will include a rezone from RL-MV and P-MV to RL-MV, P-MV (Park, Mossdale Village Combining District), and OS-MV (Open Space, Mossdale Village Combining District). The proposed uses are consistent with the proposed zoning.

Overall, the proposed Project, in combination with and past, present, and probable future projects, will have a ***less than significant*** impact relative to this topic.

Impact 4.16: Cumulative Impacts on Population and Housing (Less than Significant)

Continued development in Lathrop and San Joaquin County will result in housing unit and population increases in the region. The proposed Project includes residential units that would result in direct population growth. The Department of Finance estimates an average of 3.48 people per household in Lathrop in 2024. Based on the anticipated number of residential units that will be built in the Project site (912 units), the population would be anticipated to increase by an estimated 3,173 persons. It is noted that the Vesting Tentative Map provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units / acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the analysis is conservative as the number of units constructed at buildout would likely be closer to 829, as shown on the Vesting Tentative Subdivision Map. Utilizing the 829 unit value, the population would be anticipated to increase by an estimated 2,884 persons.

The Lathrop General Plan designates land uses to ensure a balance between new residential development and jobs-creating uses and designates the Project site for residential uses. Under the existing General Plan, the Specific Plan Area would allow for 1,171 residential units at maximum density. Under the proposed land use changes, the Specific Plan Area would allow for up to 912 residential units at maximum density. Based on the design concept, which involves a reshuffling of the residential land uses within the Specific Plan Area, the maximum residential unit count is decreased from what would be allowed under the existing General Plan.

The proposed Project would not result in direct population growth beyond the City's capacity identified in the General Plan.

The largely residential land uses proposed by the Project would be within the growth projections anticipated and analyzed in the General Plan EIR. Overall, the proposed Project is not anticipated to exceed the planned growth (directly or indirectly) in the area beyond what is anticipated in the City's General Plan or regional growth projections.

The proposed Project, when considered alongside all past, present, and probable future projects (inclusive of buildout of the various General Plans within San Joaquin County), would not be expected to cause any significant cumulative impacts. The proposed Project would not have cumulatively considerable impacts associated with population and housing. As such, implementation of the proposed Project would have a ***less than significant*** and ***less than cumulatively considerable*** contribution to impacts to population.

NOISE

The cumulative setting for noise impacts consists of the existing and future noise sources that could affect the Specific Plan Area or surrounding uses.

Impact 4.17: Cumulative Exposure of Existing and Future Noise-Sensitive Land Uses to Increased Noise Resulting from Cumulative Development (Less than Significant)

Traffic Noise: Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to the proposed Project, including on-site activities resulting from operation of the proposed Project, as well as operational noise from other development projects in the local and regional vicinity. Table 3.11-11 shows cumulative traffic noise levels with and without the proposed Project. As shown in Table 3.11-11, increases in traffic on the local roadway network are not predicted to cause significant increases in noise levels. Therefore, this would not be a cumulatively significant impact.

Construction Noise: Noise generated by construction would be temporary, and would not add to the permanent noise environment or be considered as part of the cumulative context. Activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet. Noise would also be generated during the construction phase by increased truck traffic on area roadways. A significant Project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from construction sites. This noise increase would be of short duration and would likely occur primarily during daytime hours, consistent with the City's Noise Ordinance.

Although construction activities are temporary in nature and would occur during normal daytime working hours, construction-related noise could result in sleep interference at existing noise-sensitive land uses in the vicinity of the construction if construction activities were to occur outside the normal daytime hours. Mitigation Measure 3.11-1 requires that construction activities are limited to certain hours, construction equipment is properly maintained, equipment idling is limited, and stationary equipment is located away from noise-sensitive uses. Implementation of Mitigation Measure 3.11-1 would ensure this impact is less-than-significant by ensuring construction-related noise levels do not exceed ambient noise plus 12 dBA. Therefore, within implementation of Mitigation Measure 3.11-1, the proposed Project would not have a cumulatively considerable contribution to this cumulatively considerable impact associated with construction noise.

Overall, implementation of the proposed Project would have a ***less than significant*** cumulative impact relative to this environmental topic.

PUBLIC SERVICES AND RECREATION

The cumulative setting would include all areas covered in the service areas of the City of Lathrop, as well as the Lathrop Police Department, Lathrop-Manteca Fire Protection District (LMFD), and the Manteca Unified School District (MUSD). This geographic area was chosen because these service providers would be required to serve the proposed Project and contains those service providers that have to potential to bear a cumulative impact from the proposed project, when the proposed Project is considered together with all past, present, and probably future projects within these providers' service areas.

Impact 4.18: Cumulative Impact on Public Services and Recreation (Less than Significant)

Under cumulative conditions future local and regional growth will result in increased demand for schools, police protection, fire protection, schools, parks/recreation, and library services. The City and its associated service providers must continue to evaluate the levels of service desired and the funding sources available to meet increases in demand.

The General Plan EIR analyzed impacts to public services (including police protection, fire and emergency services, schools, parks, and libraries), and found that General Plan policies addressed the public services needs of future development resulting from implementation of the General Plan. The specific environmental impact of constructing new facilities could not be determined at the time, but the EIR found that construction and operation of such facilities could potentially cause significant impacts. These potential impacts, however, were addressed and mitigated to the greatest extent feasible by the General Plan policies and mitigation measures included in the EIR.

According to the City's General Plan Update Draft EIR, development and growth facilitated by the General Plan would result in increased demand for public services, including fire protection, law enforcement, schools, parks, libraries, and other public and governmental services. As the demand for services increases, there will likely be a need for new or expanded service structures (e.g., office, maintenance, and administrative buildings and facilities, schools, parks, fire facilities, libraries, etc.) to provide for adequate staffing, equipment, and appropriate facilities to serve growth in the City. Existing facilities may be expanded at their current location. New facilities may also be constructed. The Public/Quasi-Public, Park, and Open Space land use designations would accommodate the majority of new public facilities necessary to provide community services. There would likely be environmental impacts associated with the construction or expansion of the facilities needed to provide public services. Such development would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA. Any future expansion of public facilities required by growth in the City would be required to be reviewed for site-specific impacts.

Infrastructure needed to support development of the Project area, and the subsequent population, housing and employment increases expected through implementation of the Specific Plan, have already been planned and evaluated. Additionally, all lands within the General Plan jurisdiction have been planned to accommodate growth within the City have been evaluated in the General Plan EIR and the City's Municipal Service Review.

Implementation of the proposed Project would contribute toward an increased demand for public services and facilities within the City of Lathrop. It has been determined that future development of the Specific Plan Area would not directly trigger the need for new facilities for the Lathrop Police Department, San Joaquin County Sheriff, Lathrop-Manteca Fire Protection District, and Manteca Unified School District. Project implementation would require the construction of park facilities which may cause substantial adverse physical environmental impact. Potential environmental impacts associated with the future construction of park and other recreational facilities within the Plan Area are addressed throughout this EIR. This EIR analyzes the physical environmental effects that may occur as a result of development and introduction of new residential uses within the Plan Area. Project-related parkland would fall within the range of environmental impacts disclosed in this EIR and would be subject to relevant mitigation measures included in this EIR. Conformance with the General Plan, applicable City requirements, and the payment of appropriate fees, would reduce impacts related to the development of parkland. The proposed Project and other past, present, and probable future projects would be subject to all fees that are paid toward the enhancement of public services within the region. Payment of the applicable impact fees by the proposed Project applicant, other project applicants, and ongoing revenues that would come from property taxes, sales taxes, and other revenues generated by the proposed Project and other past, present, and probable future projects, would assist in maintaining existing fire, police, schools, and park services.

Under cumulative conditions, past, present, and probable future projects would result in increased demand for public services and recreational facilities. The impact fees developed and reviewed by the City will recover future development's proportionate share of City-related capital asset costs. Fees, as applied only to new development, represent future development's proportionate share of public services and facilities capital costs. It is important to note that impact fees may not be used to correct existing deficiencies, but may be used to pay for increased demand for public facilities or increased demand upon existing capital facilities provided that those facilities are needed to serve additional development and have the capacity to do so, given relevant level-of-service standards. The construction of public facilities to serve past, present, and probably future projects may be required, which could cause substantial adverse physical environmental impacts. The construction and operation of future public facilities required to serve cumulative development could potentially cause cumulatively significant impacts, but such physical impacts cannot be fully defined at this time because the exact facilities are not proposed or known. Any future public facility would undergo its own environmental review to determine physical environmental impacts once it is contemplated, and proposed for construction.

Because no significant impacts related to public services and recreation were identified for the proposed Project, and the Project would not necessitate the construction of public facilities, implementation of the proposed Project would have a ***less than significant*** impacts on cumulative public services and recreation.

TRANSPORTATION AND CIRCULATION

This section considers the impacts of the Project within the context of long-term traffic conditions that may accompany the development of regional circulation system improvements and regional residential and non-residential development. See Section 3.13, Transportation and Circulation, for more information.

Impact 4.19: Under Cumulative conditions, the proposed Project would not adversely affect pedestrian and bicycle facilities or transit service (Less than Significant)

The proposed Project includes ample bicycle and pedestrian facilities on-site. Implementation of the proposed Project and past, present, and probable future projects would not result in a conflict with an existing or planned pedestrian facility, bicycle facility, or transit service/facility. The proposed Project, as well as past, present, and probable future projects in the City, would be required to comply with the applicable requirements outlined in the Lathrop General Plan pertaining to bicycle and pedestrian improvements, connectivity, and funding. City General Plan Policy CIR-1.1 requires future transportation projects to consider all modes of travel in planning, design and construction.

Overall, the Project would not interfere with the implementation of a planned bicycle facility, pedestrian facility, or transit service/facility. The Project, in combination with and past, present, and probable future projects, would not cause a degradation in transit service such that service does not meet performance standards established by the transit operator. The proposed Project, when considered alongside all past, present, and probable future projects (inclusive of buildout of the various General Plans within Stanislaus County), would not be expected to cause any significant cumulative pedestrian or bicycle facilities impacts. Cumulative impacts to pedestrian and bicycle facilities would be ***less than significant***.

Impact 4.20: Under Cumulative conditions, the proposed Project would not conflict with or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b) (Less than Significant)

For VMT forecasting, the City of Lathrop SB 743 guidelines states that for a project to be VMT insignificant, the project has to generate 15 percent below the Citywide average for the total home-based residential VMT per capita statistic. As the City of Lathrop does not maintain its own travel demand model, the SJCOG 2018 RTP regional travel demand model was used to generate VMT statistics for the Project.

Table 3.13-2 in Section 3.13 compares a base year model run with a base year plus Project model run. The VMT analysis for the Project assumes full buildout of the Project in the base year condition, which is a more conservative analysis since it assumes buildout of the entire Project at once, instead of the anticipated phased buildout through the forecast year of 2045. The existing base year home-based VMT per capita for TAZ #1751 is 17.28. Adding in the Project lowers the home-based VMT per capita for the TAZ to 16.45. As the citywide average for Lathrop for home-based VMT per capita is 18.17, the significance criteria (15 percent under the citywide average) would be 15.44. Without incorporating proposed features which would reduce VMT (discussed below), the Project's VMT per capita value of 16.29 is higher than the citywide threshold of 15.44.

As part of the proposed Project, the improved pedestrian network which would include pedestrian walkways along all local streets and connect into the existing pedestrian network would reduce VMT up to 5.7 percent. Additionally, the Project design implements traffic calming measures and low stress bicycle facilities, including Class II bike lanes along the proposed arterial and collector streets and a multi-use trail along the San Joaquin River which would reduce VMT up to 1.7 percent. These Project design features would reduce VMT for the Project a total of 7.4 percent. With the proposed Project design features, the Project's VMT per capita would be more than 15 percent below the Citywide average for the total home-based residential VMT per capita statistic. Consistent with the City of Lathrop's SB 743 guidelines, once a project has mitigated its base year VMT impacts to a less than significant level, it can be assumed that the project would not have a cumulative VMT impact in the forecast year. Implementation of the Project would result in a ***less than significant*** impact.

UTILITIES

The cumulative setting includes all areas covered in the service areas of the City's wastewater system, water system, stormwater system, and the solid waste collection and disposal services. Under General Plan buildout conditions, the City would see an increased demand for water service, sewer service, solid waste disposal services, and stormwater infrastructure needs.

Impact 4.20: Cumulative Impact on Wastewater Utilities (Less than Significant)

Wastewater service is provided by Lathrop via their network of collection infrastructure and the Manteca Water Quality Control Facility (MWQCF) and the Lathrop Consolidated Treatment Facility (LCTF). In 2016, the City generated a total average annual flow of 1.46 mgd with 0.92 mgd treated at the MWQCF and 0.54 mgd treated at the LCTF as documented in the City's IWRMP.

The project applicant(s) will be required to install/connect and/or fund the necessary collection/transmission infrastructure to ensure the appropriate treatment of all wastewater.

The City of Lathrop owns 14.7 percent of the MWQCF capacity by contract with the City of Manteca. The City does not participate in the operation of the facility, nor does it receive recycled water from the facility. The City is allocated 1.45 mgd of the total 9.87 mgd facility capacity. The

MWQCF is permitted for future expansions of up to 26.97 mgd, of which the City would be allocated a maximum of 14.7 percent capacity or 3.97 mgd. Treatment at the MWQCF consists of primary sedimentation followed by roughing biotowers, conventional activated sludge, secondary clarification, tertiary filtration, and ultraviolet disinfection. Disinfected tertiary effluent is discharged to the San Joaquin RiverBecause each project coming on line is required to fund any capacity increase needed to treat its wastewater, and because the existing WDRs allow for substantial increases in capacity without any need for additional Regional Water Quality Control Board approvals, the cumulative impacts of the project, together with past, present, and probable future projects, are less than significant.

Because each project coming on line is required to fund any capacity increase needed to treat its wastewater, and because the existing WDRs allow for substantial increases in capacity without any need for additional Regional Water Quality Control Board approvals, the cumulative impacts of the project, together with past, present, and probable future projects, are less than significant.

The Project by itself does not exceed the existing capacity of the wastewater treatment plant. The Project and any future cumulative projects would be required to secure adequate wastewater treatment capacity/allocation prior to occupancy of any building which would require wastewater treatment services. Implementation of the proposed Project, in combination with and past, present, and probable future projects, would have a ***less than significant*** impact relative to this topic.

Impact 4.21: Cumulative Impact on Water Utilities (Less than Significant)

Water demand from past and present development and from agricultural production activities within the boundary of the groundwater basin has contributed to groundwater decline in the region. Future urban development within the groundwater basin has potential to increase groundwater pumping within the groundwater basin. However, where new urban development occurs on land in active agricultural use, the potential exists for urban uses to reduce demand for groundwater relative to agricultural uses, as urban uses typically require less water than agricultural uses.

The Project proposes the construction of up to 912 residential units and associated park, circulation, and utility improvements. To determine the projected potable water demand for the Project, the WSA utilized a water demand factor of 330 gallons per day per dwelling unit (gpd/du) for low-density residential uses, which is based on the City's 2020 UWMP. For recycled water, the WSA utilized an application rate of 55 acre-inches per acre per year, which is based on the City's Mossdale Landing West Specific Plan. Consistent with the Specific Plan, the WSA assumes recycled water is used to irrigate all public landscaping within the proposed Project. Therefore, the total projected water demand for the proposed Project is approximately 378 AFY, which includes 337 AFY of potable water and 41 AFY of recycled water.

There would be sufficient water resources available to provide supply for buildout of the cumulative scenario, so that no significant cumulative effect on the overall water supply would result. Implementation of the proposed Project would have a ***less than significant*** and ***less than cumulatively considerable*** impact relative to this topic.

Impact 4.22: Cumulative Impact on Stormwater Facilities (Less than Significant)

Past, pending, and probable future development projects in the area could result in additional discharges of stormwater during storm events. When combined, these future development projects could, in theory, could lead to an incremental increase in peak stormwater runoff and potential incremental increases in downstream flood elevations. However, these past, pending, and probable future development projects in the area would be subject to the Multi-Agency Post-Construction Stormwater Standards Manual, the City's Stormwater Management and Discharge Control Ordinance (Chapter 13.28 of the Code), and the City's Impact Fee Ordinance (Chapter 3.20 of the Code) as applicable.

As discussed in Chapter 2.0, Project Description, and shown in Figure 2.0-9, the Project proposes to install stormwater collection and drainage infrastructure within the Project site that would be connected to the City's stormwater system via existing lines along the various residential roadways adjacent to the site. The Project's storm drain system would be designed and implemented in accordance with the Mossdale Landing Master Drainage Plan.

According to the Mossdale Landing Master Drainage Plan, the Mossdale Village drainage shed is divided into six sub-sheds with a combined area of 912 acres. Each sub-shed functions independently and has its own pump station, storm water quality basin or vault and flood control detention basin. Underground detention solutions are permitted to be used where appropriate. Each sub-shed is required to treat the first flush storm event, which is the volume of water equal to the 85th percentile of a 24-hour storm event. The pumps will begin to discharge water to a single outfall at the San Joaquin River (up to 30 percent of the peak discharge rate) once the first flush event has been treated. After the rain event is over, the pumps will continue to direct water to the river; however, if the San Joaquin River rises to a base flood level of 21.0 feet, the pumps will shut off until the water level in the river subsides.

The Project proposes to install storm drain lines in each individual residential street in Mossdale Landing West that would drain towards the main line in Marsh Road, which would cross Barbara Terry Boulevard and connect to the existing M1 Pump Station where the water would ultimately be pumped into the San Joaquin River. Any necessary upgrades to the existing pump and storm drain system would be determined by the City.

The proposed storm drain system will include water quality features designed in conformance with the standards of the Regional Water Quality Control Board for the Central Valley Region and the City of Lathrop. Stormwater regulations for construction projects using Best Management Practices will be incorporated into the design.

The proposed Project, when considered alongside all past, present, and probable future projects (inclusive of buildout of the Lathrop General Plan), would not be expected to cause any significant cumulative stormwater impacts. The proposed Project would not have cumulatively considerable impacts associated with stormwater. Implementation of the proposed Project, in combination with and past, present, and probable future projects, would have a ***less than significant*** impact relative to this topic.

Impact 4.23: Cumulative Impact on Solid Waste Facilities (Less than Significant)

The cumulative context for cumulative impacts on solid waste facilities includes the Republic Services service area.

Republic Services, a private garbage collection company provides residential and commercial garbage, recycling, and green waste collection services within the City. Waste from the City is disposed of at a number of solid waste facilities, with the majority of waste disposed at the Forward Landfill. The Forward Landfill has a daily permitted maximum of 8,668 TPD and a remaining capacity of over 24.7 million cubic yards as of 2020. The landfill has enough projected capacity to serve residents and businesses until approximately 2036. Other landfills that serve the City include the Foothill Sanitary Landfill and the Fink Road Landfill, which have enough projected capacity to serve residents and businesses until approximately 2082 and 2050, respectively.

Project implementation would increase solid waste disposal demands over existing conditions. As discussed in Section 3.10, Land Use, Population, and Housing, the Project's 912 residential units would induce direct population growth in the City. Based on the 2024 Department of Finance estimated household size of 3.48 people per household in Lathrop,[2] the Project's forecast population growth is 3,174 persons. As described above, the City of Lathrop achieved a disposal rate of 4.1 pounds per person per day in 2022 (most recent year available). Assuming disposal rates remain constant throughout Project operation, the new growth associated with the Project would result in an increase of approximately 13,013.4 pounds per day of solid waste, which equals approximately 6.5 tons per day or 2,375 tons of solid waste per year. This is less than one-tenth of one percent (0.075 percent) of the Forward Landfill's daily permitted maximum of 8,668 TPD; less than one percent (0.43 percent) of the Foothill Sanitary Landfill's daily permitted maximum of 1,500 TPD; and less than one percent (0.27 percent) of the Fink Road Landfill's daily permitted maximum of 2,400 TPD.

The proposed Project would be required to comply with applicable state and local requirements including those pertaining to solid waste, construction waste diversion, and recycling. In conclusion, implementation of the proposed Project, in combination with and past, present, and probable future projects, would have a ***less than significant*** cumulative impact relative to this environmental topic.

---

[2] California Department of Finance, E-5 Population and Housing Estimates for Cities, Counties, and the State, January 2021-2024, with 2020 Benchmark. May 2024. Available: https://dof.ca.gov/forecasting/demographics/estimates/e-5-population-and-housing-estimates-for-cities-counties-and-the-state-2020-2024/. Accessed: May 20, 2024.

4.2 SIGNIFICANT IRREVERSIBLE EFFECTS

LEGAL CONSIDERATIONS

EIRs for certain kinds of projects, as set forth in CEQA Guidelines section 15127, must discuss significant irreversible environmental changes. These projects include those involving (i) the adoption, amendment, or enactment of a plan, policy, or ordinance of a public agency, (ii) the adoption by a Local Agency Formation Commission of a resolution making determinations, or (iii) the parallel preparation of an environmental impact statement under the federal National Environmental Policy Act.

Here, the proposed Project falls into two of these categories, in that it requires the adoption or amendments of plans, policies, and ordinances, and will require actions and determinations by San Joaquin LAFCO. Irreversible environmental effects are described as:

- The project would involve a large commitment of nonrenewable resources;
- The primary and secondary impacts of a project would generally commit future generations to similar uses (e.g., a highway provides access to previously remote area);
- The project involves uses in which irreversible damage could result from any potential environmental accidents associated with the project; or
- The phasing of the proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy).

Determining whether the proposed Project would result in significant irreversible effects requires a determination of whether key resources would be degraded or destroyed such that there would be little possibility of restoring them. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Analysis

Implementation of the proposed Project would result in the conversion of land currently used for agricultural and rural residential uses for the development of residential uses. Development of the proposed Project would constitute a long-term commitment to these uses. It is unlikely that circumstances would arise that would justify the return of the land to its original condition as agricultural or vacant rural land.

A variety of resources, including land, energy, water, construction materials, and human resources, would be irretrievably committed for the initial construction, infrastructure installation and connection to existing utilities, and their continued maintenance. Construction of the proposed Project would require the commitment of a variety of other non-renewable or slowly renewable natural resources such as lumber and other forest products, sand and gravel, asphalt, petrochemicals, and metals.

Additionally, a variety of resources would be committed to the ongoing operation and life of the proposed Project. The introduction of residential and public park uses to the Specific Plan Area will result in an increase in area traffic over existing conditions. Fossil fuels are the principal source of energy and the proposed Project will increase consumption of available supplies, including gasoline and diesel. These energy resource demands relate to initial Project construction, Project operation and site maintenance and the transport of people and goods to and from the Specific Plan Area.

4.3 SIGNIFICANT AND UNAVOIDABLE IMPACTS

CEQA Guidelines Section 15126.2(b) requires an EIR to discuss unavoidable significant environmental effects, including those that can be mitigated but not reduced to a level of insignificance. The following significant and unavoidable impacts of the proposed Project are discussed in Sections 3.1 through 3.14 and previously in this chapter (cumulative-level). Refer to those discussions for further details and analysis of the significant and unavoidable impact identified below:

- Impact 3.2-1: The proposed Specific Plan would result in the conversion of Farmlands, including Prime Farmland, Unique Farmland, and Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural uses
- Impact 3.2-2: The proposed Project has the potential to conflict with existing zoning for agricultural use, or Williamson Act Contracts.
- Impact 3.14-2: The proposed Project would not have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years.
- Impact 4.4: Cumulative Impact on Agricultural Resources

4.4 GROWTH-INDUCING IMPACTS

Section 15126.2(d) of the CEQA Guidelines requires an EIR to "discuss the ways in which the project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth..." In general terms, a project may result in a significant growth inducing impact if it individually or cumulatively with other projects results in any of the actions described in the following examples:

- The project removes an obstacle to growth, such as: the establishment of an essential public service, the provision of new access to an area, or a change in zoning or general plan designation.
- The project results in economic expansion, population growth or the construction of additional housing occurs in the surrounding environment in response to the project, either directly or indirectly.

Existing storm drain, sewer, water, and gas lines/pipes are currently located within the roadways of the adjacent residential uses to the north and west. The Project would be served by the existing service providers that have been established on the Project site and in the Project area. Site access would be provided by Town Center Drive and River Islands Parkway. Overall, the proposed Project would not require an extension of public services that have the potential to result in or facilitate unplanned growth in the Project area.

The proposed Project would provide housing opportunities for City and County residents on a site that has been planned for residential development by the City of Lathrop General Plan and associated EIR. Overall, the additional residential uses in the City would not have the long-term effect of inducing population growth.

The Project would result in an increase in employment opportunities by creating short-term construction employment opportunities, but these opportunities would not result in substantial population growth in the project region. Therefore, the proposed Project would not result in significant growth inducing impacts.

This page left intentionally blank.

5.1 CEQA REQUIREMENTS

The California Environmental Quality Act (CEQA) requires that an Environmental Impact Report (EIR) analyze a reasonable range of feasible alternatives that would feasibly attain most of the basic objectives of the project while reducing or avoiding one or more significant environmental effects of the project. The range of alternatives required in an EIR is governed by a "rule of reason" that requires an EIR to set forth only those alternatives necessary to permit a reasoned choice (CEQA Guidelines Section 15126.6[f]). Where a potential alternative was examined but not chosen as one of the range of alternatives, the CEQA Guidelines require that the EIR briefly discuss the reasons the alternative was dismissed.

Alternatives that are evaluated in the EIR must be potentially feasible alternatives. However, not all possible alternatives need to be analyzed. An EIR must "set forth only those alternatives necessary to permit a reasoned choice." (CEQA Guidelines, Section 15126.6(f).) The CEQA Guidelines provide a definition for a "range of reasonable alternatives" and, thus limit the number and type of alternatives that need to be evaluated in an EIR.

First and foremost, alternatives in an EIR must be potentially feasible. In the context of CEQA, "feasible" is defined as:

> *… capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.* (CEQA Guidelines 15364)

The inclusion of an alternative in an EIR is not evidence that it is feasible as a matter of law, but rather reflects the judgment of lead agency staff that the alternative is potentially feasible. The final determination of actual feasibility will be made by the lead agency decision-making body through the adoption of CEQA Findings at the time of action on the Project. (*California Native Plant Society v. City of Santa Cruz* (2009) 177 Cal.App.4th 957, 999-1001 (*CNPS*); *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal.App.4th 477, 489; see also CEQA Guidelines, §§ 15091(a)) (3) [findings requirement, where alternatives can be rejected as infeasible]; 15126.6 [([an EIR] must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation"].) The following factors may be taken into consideration in the assessment of the feasibility of alternatives: site suitability, economic viability, availability of infrastructure, general plan consistency, other plan or regulatory limitations, jurisdictional boundaries, and the ability of the proponent to attain site control (Section 15126.6 (f) (1)).

In addition, agency decisionmakers, in assessing actual feasibility, may legitimately consider whether particular alternatives, compared with a proposed project, represent an undesirable balance of competing policy considerations or fail to attain project objectives to the same degree as a proposed project. (See *City of Del Mar v. City of San Diego* (1982) 133 Cal.App.3d 410, 417 ["'feasibility' under CEQA encompasses 'desirability' to the extent that desirability is based on a reasonable balancing of the relevant economic, environmental, social, and technological factors"];

CNPS, *supra*, 177 Cal.App.4th at p. 1001[same]; *San Diego Citizenry Group v. County of San Diego* (2013) 219 Cal.App.4th 1, 17 [same]; *Sierra Club v. County of Napa* (2004) 121 Cal.App.4th 1490, 1506-1509 [upholding CEQA findings rejecting alternatives in reliance on applicant's project objectives]; *Citizens for Open Government v. City of Lodi* (2012) 296 Cal.App.4th 296, 314-315 [court upholds agency action where alternative selected "entirely fulfill" a particular project objective and "would be 'substantially less effective' in meeting" the lead agency's "goals"]; and *In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2008) 43 Cal.4th 1143, 1165, 1166 (Bay-Delta) ["feasibility is strongly linked to achievement of each of the primary program objectives"; "a lead agency may structure its EIR alternative analysis around a reasonable definition of underlying purpose and need not study alternatives that cannot achieve that basic goal"].)

Special considerations come into play where a project proposes housing. Government Code section 65589.5, subdivision (j), provides that "[w]hen a proposed housing development project complies with applicable, objective general plan, zoning, and subdivision standards and criteria, including design review standards, in effect at the time that the application was deemed complete," the local lead agency may not "disapprove the project or … impose a condition that the project be developed at a lower density" unless the agency can issue "written findings supported by a preponderance of the evidence on the record" both (a) that "[t]he housing development project would have a specific, adverse impact upon the public health or safety unless the project is disapproved or approved upon the condition that the project be developed at a lower density" and (b) that "[t]here is no feasible method to satisfactorily mitigate or avoid the adverse impact" on public health and safety "other than the disapproval of the housing development project or the approval of the project upon the condition that it be developed at a lower density." In this context, "a "specific, adverse impact" means a significant, quantifiable, direct, and unavoidable impact, based on objective, identified written public health or safety standards, policies, or conditions as they existed on the date the application was deemed complete."

An earlier version of section 65589.5, subdivision (j), came into play in *Sequoyah Hills Homeowners Assn. v. City of Oakland* (1993) 23 Cal.App.4th 704, 715-716. In that case, the court upheld a lead agency decisionmaking body's rejection, in findings adopted at the time of project approval, of an EIR alternative that would have provided fewer housing units than the proposed project. The city council found the alternative to be infeasible because it "would defeat the project objective of providing the 'the least expensive single-family housing for the vicinity.'" This conclusion was supported by market surveys indicating that the houses constructed under the alternative "would be necessarily more expensive than those of the proposed project." The court also invoked Government Code section 65589.5, subdivision (j), noting that the city council found that there was no substantial evidence that the proposed project would cause any public health or safety impact, and that the agency's record contained no evidence any such impact. The court agreed with the respondent agency that "this enactment is not a legislative will-o'-the-wisp" but rather "is based on a legislative finding that 'The lack of affordable housing is a critical problem which threatens the economic, environmental, and social quality of life in California.'"

In considering the approval of a proposed housing project, local agency decisionmakers must also be cognizant of Government Code section 66300, created by Senate Bill 330 from 2019 (also known as the Housing Crisis Act of 2019). Subdivision (b)(1)(A) of section 66300 generally prevents a city from changing an existing residential general plan, specific plan, and zoning designation predating January 1, 2018, to “a less intensive use” or to reduce the intensity of the designation below what was allowed on January 1, 2018. An exception to this prohibition exists, however, where the city “concurrently changes the development standards, policies, and conditions applicable to other parcels within the jurisdiction to ensure that there is *no net loss* in residential capacity.” (Gov. Code, § 65300 (h)(2)(i)(1) [italics added].)

Finally, a third statute that limits agencies’ discretion to reduce the densities of proposed housing projects is Public Resources Code section 21159.26, which states that, “[w]ith respect to a project that includes a housing development, a public agency may not reduce the proposed number of housing units as a mitigation measure or project alternative for a particular significant effect on the environment if it determines that there is another feasible specific mitigation measure or project alternative that would provide a comparable level of mitigation.”

Equally important to the formulation of a reasonable range of alternatives in an EIR is the need for alternatives to substantially lessen one or more of the significant effects of a proposed project. Although the law does not require agencies to exclusively focus in this context on the significant unavoidable effects of a proposed project, doing so is certainly an effective way to meet this requirement. Here, the following significant and unavoidable impacts of the proposed Specific Plan are discussed in Sections 3.1 through 3.14 (project-level) and Chapter 4.0 (cumulative-level):

- Impact 3.2-1: The proposed Specific Plan would result in the conversion of Farmlands, including Prime Farmland, Unique Farmland, and Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural uses;
- Impact 3.2-2: The proposed Project has the potential to conflict with existing zoning for agricultural use, or Williamson Act Contracts.
- Impact 4.4: Cumulative Impact on Agricultural Resources
- Impact 3.14-2: The proposed Project would not have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years.

The following analysis of alternatives focuses on significant impacts of the proposed Project, including both those that can be mitigated to a less-than-significant level and those that would remain significant even if mitigation is applied or for which no feasible mitigation is available.

A Notice of Preparation (NOP) was circulated to the public to solicit recommendations for a reasonable range of alternatives to the proposed project. Additionally, a public scoping meeting was held during the public review period to solicit recommendations for a reasonable range of alternatives to the proposed project. No specific alternatives were recommended by commenting agencies or the general public during the NOP public review process.

PROJECT OBJECTIVES

The underlying purpose of the proposed Project is the approval and subsequent implementation of the Specific Plan as a means of increasing the housing supply in San Joaquin County and the State of California.

The proposed Project identifies the following objectives:

- Complete neighborhoods which foster a mixture of compatibly scaled housing types on urban lots.
- A residential development that will incorporate traditional elements found throughout Central Valley communities including a hierarchy of interconnected streets, the incorporation of assorted architectural styles, tree lined thoroughfares, an emphasis upon pedestrian scale and access with a nod to the agricultural traditions of the Valley.
- Street patterns which are carefully configured to allow for multiple outlets from neighborhoods, and to provide for connections between neighborhoods, without encouraging through traffic to create convenience and access without a private automobile.
- A network of planned walkways and bikeways which make getting outside convenient, easy and enjoyable.
- Durable construction materials and designs suited to local conditions to contribute to the ongoing costs of the housing will be encouraged.
- Provide a range of housing opportunities to support a diverse population, lifestyles, and family groups.
- Establish a planning/zoning concept that is responsive to the market.
- Implement the Phasing Plan for logical development in line with the West Lathrop Specific Plan.
- Implement City's Infrastructure Master Plans.

5.2 ALTERNATIVES CONSIDERED IN THIS EIR

Three alternatives to the proposed Project were developed based on input from City staff, and the technical analysis performed to identify the environmental effects of the proposed Project. The alternatives analyzed in this EIR include the following three alternatives in addition to the proposed Project:

- **No Project (No Build) Alternative**: Under this alternative, development of the Plan Area would not occur, and the Plan Area would remain in its current existing condition.
- **Increased Density Alternative:** Under this alternative, the proposed Project would be developed with the same amenities as described in the Project Description, but the density of the residential uses would be increased, and the total development footprint would be equal to the proposed Specific Plan.

- **Lower Density Alternative:** Under this alternative, the proposed Project would be developed in such a way to promote larger lot sizes and to reduce the overall number of residential units.

NO PROJECT (NO BUILD) ALTERNATIVE

Under the No Project (No Build) Alternative development of the Plan Area would not occur, and the Plan Area would remain in its current existing condition. The majority of the Plan Area is currently undeveloped (Figure 2.0-4 in Chapter 2.0, Project Description). There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures. Under this alternative, the Plan Area would not be rezoned and a General Plan Amendment would not occur. The Plan Area would remain subject to existing City planning indefinitely. It is noted that the No Project (No Build) Alternative would fail to meet the Project objectives.

INCREASED DENSITY ALTERNATIVE

Under the Increased Density Alternative, the proposed Project would be developed with the same amenities as described in the Project Description, but the density of the residential uses would be increased, and the total development footprint would be equal to the proposed Specific Plan. This alternative would include development of single-family homes, apartments, and auto court multi-family units. Under the Increased Density Alternative, the same number of residential units as the proposed Project (up to 912 units) would be constructed. However, this alternative would include development of 50 percent low density units (up to 456 units), 30 percent medium density units (up to 274 units) and high density units (up to 182 units). Additionally, the park areas would increase compared to the Project. The Increased Density Alternative provides the approximate acreages of the following land uses:

- approximately 70.0 acres of low-density residential uses;
- approximately 20.0 acres of medium-density residential uses;
- approximately 10.0 acres of high-density residential uses;
- approximately 63.2 acres of public designated uses that are made up of:
    - approximately 8.0 acres of linear parks;
    - approximately 10.0 acres of neighborhood park (centrally located);
    - approximately 39.7 acres of community park (along the San Joaquin River);
    - approximately 2.0 acres of parkland dedication south of River Islands Parkway;
    - approximately 2.1 acres of other open space (including landscaped entries); and
    - approximately 1.4 acres of levee slope easement.

The residential areas would be clustered in the central and eastern portions of the Project site at increased densities to allow for an increase in park areas along the San Joaquin River. This alternative would also plan for parks, trails, circulation improvements, and utility improvements in a similar way as the proposed Project.

LOWER DENSITY ALTERNATIVE

Under the Lower Density Alternative, the proposed Project would be developed in such a way to promote larger lot sizes and to reduce the overall footprint of the developed areas. This alternative would include development of custom homes on approximately 8,000 square foot (sf) lots, as compared to the 3,360 sf to 5,000 sf lot sizes for the low density residential units proposed by the Project. Under the Lower Density Alternative, the number of residential units constructed in the Plan Area would be reduced by 25 percent compared to the proposed Project. Under the proposed Project, up to 912 residential units would be constructed; this alternative would result in construction of up to 684 units.

The Lower Density Alternative provides the approximate acreages of the following land uses:

- approximately 146.7 acres of low-density residential uses;
- approximately 16.5 acres of Public designated uses that are made up of:
    - approximately 4.8 acres of linear park;
    - approximately 6.2 acres of neighborhood park;
    - approximately 2.0 acres of parkland dedication south of River Islands Parkway;
    - approximately 2.1 acres of other open space (including landscaped entries); and
    - approximately 1.4 acres of levee slope easement.

This alternative would also plan for parks, trails, circulation improvements, and utility improvements.

5.3 ENVIRONMENTAL ANALYSIS

The alternatives analysis provides a summary of the relative impact level of significance associated with each alternative for each of the environmental issue areas analyzed in this EIR. Following the analysis of each alternative, Table 5.0-1 summarizes the comparative effects of each alternative.

NO PROJECT (NO BUILD) ALTERNATIVE

Aesthetics and Visual Resources

The No Project (No Build) Alternative would leave the Project site in its existing largely undeveloped state and would not result in increases in daytime glare or nighttime lighting. The visual character of the Project site would not change under this alternative compared to existing conditions.

As described in Section 3.1, the visual character of the Project site would be significantly altered as a result of Project implementation. Implementation of the proposed Design Guidelines and landscaping requirements, and consistency with the General Plan and the Lathrop Zoning Ordinance, would ensure that impacts are reduced to the greatest extent possible.

The proposed Project lighting would be required to incorporate design features, consistent with Lathrop General Plan, to minimize the effects of light and glare, and material selections aimed to limit light and glare. Implementation of the Specific Plan requirements and standards in conjunction with the Lathrop General Plan and municipal code standards for lighting would reduce potential impacts associated with nighttime lighting, light spillage onto adjacent properties, and glare to a less than significant level.

The proposed Project would result in potentially significant new sources of light and glare. The proposed Project would also result in impacts to the existing visual character or quality of the Project site and its surroundings. However, the No Project (No Build) Alternative would avoid these impacts altogether. As such, this impact would be reduced when compared to the proposed Project.

Agricultural Resources

Currently, the majority of the Project site is used for agricultural purposes. The No Project (No Build) Alternative would not result in development of the Project site and agricultural uses would continue. As such, this alternative would have no impact on agricultural land, no potential for conflicts with existing agricultural resources, and no potential for conflict with regulations and plans intended to protect those resources. As such, this impact would be reduced when compared to the proposed Project.

Air Quality

As described in Section 3.3, San Joaquin County has a State designation Attainment or Unclassified for all criteria pollutants except for ozone, PM_{10} and $PM_{2.5}$. San Joaquin County has a national designation of either Unclassified or Attainment for all criteria pollutants except for Ozone and $PM_{2.5}$. Table 3.3-2 in Section 3.3 presents the state and federal attainment status for San Joaquin County.

As discussed in Section 3.3, as shown in Table 3.3-8, the proposed Project's operational criteria pollutant would not exceed the applicable SJVAPCD thresholds of significance for all criteria air pollutants.

The proposed Project is subject to the SJVAPCD Rule 9510 (Indirect Source Rule [ISR]), which could result in substantial mitigation of NO_X and associated ROG emissions. The reductions are accomplished by the incorporation of mitigation measures into projects and/or by the payment of an Indirect Source Rule fee for any required reductions that have not been accomplished through Project mitigation commitments.

Under the No Project (No Build) Alternative, the Project site would not be developed, and the existing agricultural operations within the Plan Area would continue. Criteria air pollutant emissions are currently generated by the use of vehicles, agricultural equipment, land surface disturbance, and building energy use as a result of existing site operations.

Under the No Project (No Build) Alternative, there would be no net change in current levels of emissions and no potential for a conflict with any adopted plans or policies related to air quality. As such, this impact would be reduced when compared to the proposed Project.

Biological Resources

As described in Section 3.4, Biological Resources, construction on the Project site has the potential to result in impacts to special-status species in the region. The Project site provides potential habitat for several species, including those discussed in Section 3.4.

Mitigation Measure 3.4-1 requires the Project applicant to conduct a survey for special-status bumble bee habitat, and avoid or minimize impacts to special-status bumble bee habitat by developing a mitigation plan in accordance with the most current guidelines. Mitigation Measure 3.4-2 requires coverage under the SJMSCP to mitigate for habitat impacts to covered special-status species. Mitigation Measure 3.4-4 requires the Project applicant to conduct a survey of the area to be graded for bat roosts, and if present, implement measures to avoid or minimize impacts on special-status bats. See Mitigation Measures 3.4-1 through 3.4-4 for more information regarding the biological resources measures.

Under the No Project (No Build) Alternative, the proposed Project would not be constructed and no habitat would be removed. Zero acres of habitat would be converted under this alternative. However, ground disturbing activities associated with the on-site agricultural uses would occur. Periodic ground disturbance of the agricultural fields and row crops could impact ground nesting birds. Overall, this impact would be reduced when compared to the proposed Project.

Cultural and Tribal Resources

As discussed in Section 3.5, Cultural and Tribal Resources, there are no historic or cultural resources are known to occur within the Project site. However, there is potential of discovery of previously unknown historic or cultural resources during ground-disturbing activities. Mitigation Measure 3.5-1 and measure 3.5-2 addresses the potential impacts to historic or cultural resources by requiring and implementing an Archaeological Monitoring Program, whereby the Project proponents shall retain the services of an experienced archaeologist who will be present on-site to observe ground-disturbing activities requiring grubbing, grading, trenching, or excavation; and by conducting pre-construction worker cultural resources sensitivity training. Any previously unknown cultural and/or tribal resources which may be discovered during development of the proposed Project would be required to be preserved, either through preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. Impacts related to substantial adverse changes to an historical resource as defined in CEQA Guidelines §15064.5, a unique archaeological resource as defined in Public Resources Code section 21083.2, or a tribal cultural resource, as defined in Public Resources Code §21074, would be significant and unavoidable with mitigation. Impacts related to disturbance of human remains, including those interred outside of formal cemeteries, would be less than significant with mitigation.

The No Project (No Build) Alternative would result in no additional ground disturbing activities beyond those associated with ongoing agriculture. While the ground disturbance associated with agricultural uses would have the potential to disturb or destroy cultural, tribal, historic, and archaeological resources, as well as paleontological resources, the depth of disturbance under the No Project (No Build) Alternative would be significantly less compared to the depths required for utility placement, grading, and overall construction activities associated with the proposed Specific

Plan. While the proposed Project is not anticipated to result in significant impacts to cultural or tribal resources with mitigation, the No Project (No Build) Alternative would result in less potential for impacts to cultural and tribal resources as the entire Project site would continue to be used for agriculture production. As such, this impact would be reduced when compared to the proposed Project.

Geology and Soils

As described in Section 3.6, implementation of the proposed Project would result in the construction of new structures on the Project site. The new structures would be subject to seismic, geologic, and soils hazards for the life of the Project. Mostly notably, the proposed Project would be subject to liquefaction, liquefaction induced settlement, and lateral spreading. The Project would be required to comply with the provisions of the CBSC, which includes design requirements to mitigate the effects of potential hazards associated with seismic ground shaking. Further, the Project would be reviewed by the City for conformance with the General Plan, Municipal Code, and other regulations that address seismic safety issues and would be required to comply with standard engineering and seismic safety design considerations to minimize potential impacts. Conformance with the CBSC, General Plan, Municipal Code, and other regulations address construction activities and soil erosion. Each phase of Project construction disturbing one acre or more of soil would be required to obtain coverage under the Construction General Permit prior to issuance of a grading permit. The Construction General Permit requires development and implementation of a SWPPP and monitoring plan, which must include erosion-control and sediment-control BMPs that would meet or exceed measures required by the Construction General Permit to control stormwater quality degradation due to potential construction-related pollutant.

The No Project (No Build) Alternative would result in the Project site remaining in its existing condition and therefore would not involve new construction that could be subject to seismic, geologic or soils hazards, thus this alternative would have no potential for impact. As such, this impact would be reduced when compared to the proposed Project.

Greenhouse Gases, Climate Change, and Energy

Greenhouse gas emissions from a single Project will not cause global climate change; however, greenhouse gas emission from multiple projects throughout a region or state could result in a cumulative impact with respect to global climate change.

Implementation of the proposed Project would generate GHG emissions that would not otherwise exist without the proposed Project, although, as the California Supreme Court has said, “the future residents and occupants of development enabled by Project approval would exist and live somewhere else if this Project is not approved. Whether ‘here or there,’ GHG emissions associated with such population growth will occur.” (*Center for Biological Diversity v. California Department of Fish and Wildlife* (2015) 62 Cal.4th 204, 219.) Short-term construction emissions of GHGs are estimated at a maximum of approximately 1,661 MT CO_2e per year. The annual unmitigated GHG emissions associated with the proposed Project would be approximately 12,187 MT CO_2e. The proposed Project would not conflict with any of the GHG reduction measures contained with the

CARB's 2022 Scoping Plan Update and the SJCOG's 2022 RTP/SCS, as provided above. Therefore, the proposed Project would be consistent with the State GHG reduction targets, and would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment or to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The proposed Project's criteria pollutant emissions would be considered to have a less than significant impact.

Under the No Project (No Build) Alternative, the Project site would not be developed. Emissions are currently generated by the use of vehicles, agricultural equipment, and building energy use as a result of existing site operations. Under the No Project (No Build) Alternative, there would be no net change in emissions and no potential for a conflict with any adopted plans or policies related to air quality. As such, this impact would be reduced when compared to the proposed Project.

Hazards and Hazardous Materials

The proposed Project includes components which will likely use a variety of common household hazardous materials including: paints, cleaners, and cleaning solvents. There will be a risk of release of these materials into the environment if they are not stored and handled in accordance with best management practices approved by the San Joaquin County Environmental Health Department and the Lathrop Manteca Fire Protection District.

Under the No Project (No Build) Alternative, no new land uses would be introduced to the Project site. As shown in Table 3.8-1 and Table 3.8-2 in Section 3.8, Hazards and Hazardous Materials, There are no hazardous substance site locations database within the Project site.

As part of the Phase I ESA, there are three Leaking Underground Storage Tank (LUST) Cleanup Sites and one Cleanup Program Site within 1.5 miles of the Project site. These sites all have a status of "Completed – Case Closed" indicating that a closure letter or other formal closure decision document has been issued for the site. There are also two permitted underground storage tank (UST) sites within 1.5 miles of the Project site. No evidence of current or former USTs was observed during the site reconnaissance.

Like most agricultural and farming operations in the Central Valley, agricultural practices in the area have used agricultural chemicals including pesticides and herbicides as a standard practice. Although no contaminated soils have been identified in the Project area or the vicinity above applicable levels, residual concentrations of pesticides may be present in soil as a result of historic agricultural application and storage. Continuous spraying of crops over many years can potentially result in a residual buildup of pesticides in farm soils. Project construction activities would involve demolition, land clearing, mass grading, and other ground-disturbing activities that could expose contaminated soils.

Under the No Project (No Build) Alternative, the use of pesticides, herbicides, and insecticides would continue in the on-site agricultural areas. Because new land uses or significant ground disturbance (outside of the normal agricultural operations) would occur under this alternative, the potential for hazardous material release on the Project site would be eliminated. For all of these reasons, this impact would be reduced when compared to the proposed Project.

Hydrology and Water Quality

As described in Section 3.9, with the design and construction of improvements included in the proposed storm drainage system, the proposed Project would not increase peak stormwater runoff. The proposed Project, along with several of the related projects within the City of Lathrop, would ultimately discharge stormwater runoff to on-site detention basins, the City's system laterals, the San Joaquin River, or the groundwater basin. This would potentially degrade the water quality of the system. The proposed Project would not cause the substantial depletion of groundwater supplies or interfere substantially with groundwater recharge, or result in significant impacts related to flooding.

Construction of the proposed Project would contribute to a cumulative increase in urban pollutant loading, which could adversely affect water quality. Cumulative development in the Lathrop area, including the proposed Project, would also result in increased impervious surfaces that could increase the rate and amount of runoff, thereby potentially adversely affecting existing surface water quality through increased erosion and sedimentation. The primary sources of water pollution include: runoff from roadways and parking lots; runoff from landscaping areas; non-stormwater connections to the drainage system; accidental spills; and illegal dumping. Runoff from roadway and parking lots could contain oil, grease, and heavy metals; additionally, runoff from landscaped areas could contain elevated concentrations of nutrients, fertilizers, and pesticides. In accordance with the NPDES Stormwater Program, the Project would be subject to the existing regulatory requirements to prepare a Stormwater Pollution Prevention Plan (SWPPP) designed to control erosion and the loss of topsoil to the extent practicable using BMPs that the RWQCB has deemed effective in controlling erosion, sedimentation, runoff during construction activities.

The proposed Project would replace agricultural water uses with urban water uses. The net change in water demand derived from this conversion is the difference between the existing agricultural baseline demand (i.e., the water demand resulting from the No Project [No Build] Alternative) and water demand from development within the Plan Area.

Under the No Project (No Build) Alternative, potential water quality impacts from construction and operation of the proposed Project would be eliminated. While groundwater recharge is not considered a significant impact under the proposed Project, under this alternative, the land will be kept in its present state with the majority of the Project site being used for agricultural purposes. The Project Area has soils with hydrologic rating of "C". Group "C" soils have moderately high runoff potential when thoroughly wet.

Surface water pollution is also caused by erosion resulting from agricultural operations. Excessive and improperly managed grading, vegetation removal, quarrying, logging, and agricultural practices all lead to increased erosion of exposed earth and sedimentation of watercourses during rainy periods. In slower moving water bodies these same factors often cause a buildup of siltation, which ultimately reduces the capacity of the water system to percolate and recharge groundwater basins, as well as adversely affecting both aquatic resources and flood control efforts.

The No Project (No Build) Alternative would have a greater chance of groundwater recharge because it would not introduce large areas of impervious surfaces as would the proposed Project.

As such, potential impacts related to hydrology and water quality would be reduced under the No Project (No Build) Alternative when compared to the proposed Project.

Land Use, Population, and Housing

The Project would directly introduce new residents to the City as housing is proposed as part of the Project. The Project would require a zoning and general plan amendment for land use changes. However, impacts to land use, population and housing are considered less than significant.

The No Project (No Build) Alternative would result in no changes to land use and would have no development. Because the No Project (No Build) Alternative would not add any additional population, impacts related to population would be reduced when compared to the proposed Project. It is noted, however, that the population growth resulting from the proposed Project would be within the growth projections assumed for the Project site by the General Plan and associated EIR. The No Project (No Build) Alternative would be inconsistent with the General Plan and zoning designations for the site because the agricultural uses which would continue the site under this alternative are not allowed within the existing land use or zoning districts. Overall, the impacts related to land use, population and housing under this alternative would be reduced compared to the proposed Project.

Noise

The proposed Project could increase noise-generating activities associated with the maintenance and operation of the proposed Project, as well as from vehicular traffic. Mitigation measures provided in Section 3.11 would reduce some potential impacts to a less than significant level. However, impacts associated with generation of unacceptable construction and traffic noise levels at existing receptors would remain significant and unavoidable.

Under the No Project (No Build) Alternative, the Project site would not be developed and there would be no potential for new noise sources. As such, this impact would be reduced when compared to the proposed Project.

Public Services and Recreation

Under the No Project (No Build) Alternative, the Project site would remain undeveloped and there would be no increased demand for public services or recreation. The recreational amenities within the proposed Project, however, would not be developed for community use. The No Project (No Build) Alternative would have a reduced impact when compared to the proposed Project because demand on public services would be reduced with compared to the proposed Project, with the possible exception of recreational park facilities.

Transportation and Circulation

The No Project (No Build) Alternative would not introduce additional vehicle trips onto the study area roadways. As described in Section 3.14, for VMT forecasting, the City of Lathrop states that for a project to be VMT insignificant, the project has to generate 15 percent below the Citywide average for the total home-based residential VMT per capita statistic.

Adding in the Project lowers the home-based VMT per capita for the TAZ to 16.45. As the citywide average for Lathrop for home-based VMT per capita is 18.17, the significance criteria (15 percent under the citywide average) would be 15.44. Without incorporating proposed features which would reduce VMT (discussed below), the Project's VMT per capita value of 16.29 is higher than the citywide threshold of 15.44.

To ensure the Project would result in a VMT per capita which is below threshold, a decrease of 6.14 percent (or 1.01 VMT per capita) would be required for the Project. As part of the proposed Project, the improved pedestrian network which would include pedestrian walkways along all local streets and connect into the existing pedestrian network would reduce VMT up to 5.7 percent. Additionally, the Project design implements traffic calming measures and low stress bicycle facilities, including Class II bike lanes along the proposed arterial and collector streets and a multi-use trail along the San Joaquin River which would reduce VMT up to 1.7 percent. These Project design features would reduce VMT for the Project a total of 7.4 percent. With the proposed Project design features, the Project's VMT per capita would be more than 15 percent below the Citywide average for the total home-based residential VMT per capita statistic.

Under the No Project (No Build) Alternative, these potential impacts would be avoided, and the No Project (No Build) Alternative would have a reduced traffic impact when compared to the proposed Project.

Utilities

Implementation of the proposed Project would result in increased flows to the public wastewater system. The wastewater system can handle the increased flows with their existing permit and infrastructure.

Implementation of the proposed Project would result in increased demand for potable water. The technical analyses shows that the total projected water supplies determined to be available for the proposed Project during normal, single dry, and multiple dry years through 2040 will meet the projected water demand associated with the proposed Project, in addition to existing and planned future uses. However, supply shortfalls of three percent (450 AF) are projected to occur in 2045 for single dry years and the third and fourth years of a multiple dry year period. It should be noted that similar to Project conditions, under existing conditions (i.e., without Project implementation), the 2020 UWMP projects that the City will experience supply shortfalls (314 AF or two percent) in 2045 during single dry years and third and fourth years of a multiple dry year period. If supply shortfalls do occur, the City expects to meet these supply shortfalls through water demand reductions and other shortage response actions by implementing its WSCP, in addition to a number of strategies and actions to minimize the potential for water supply shortfalls. Nevertheless, there would be a projected supply shortfall in 2045 for single dry years and the third and fourth years of a multiple dry year period. The impact would remain significant and unavoidable.

Implementation of the proposed Project would result in increased storm drainage from new impervious surfaces. The proposed Project includes a storm drainage collection system to handle the increased storm drainage.

Implementation of the proposed Project would result in increased generation of solid waste. However, the landfill has adequate capacity to dispose the solid waste.

Further, the proposed Project would not result in the relocation or construction of new or expanded electrical, and telecommunications facilities, the construction or relocation of which could cause significant environmental effects.

Under the No Project (No Build) Alternative, the Project site would not increase the demand for any utilities, including wastewater services, potable water supplies, or solid waste disposal. There would be no need to construct stormwater drainage infrastructure. Overall, the demand for utilities would be reduced under the No Project (No Build) Alternative when compared to the proposed Project.

INCREASED DENSITY ALTERNATIVE

Aesthetics and Visual Resources

As described in Section 3.1, the visual character of the Project site would be significantly altered as a result of Project implementation. Implementation of the proposed Design Guidelines and landscaping requirements, and consistency with the General Plan and the Lathrop Zoning Ordinance, would ensure that impacts are reduced to the greatest extent possible.

The proposed Project lighting would be required to incorporate design features, consistent with Lathrop General Plan, to minimize the effects of light and glare, and material selections aimed to limit light and glare. Implementation of the Specific Plan requirements and standards in conjunction with the Lathrop General Plan and municipal code standards for lighting would reduce potential impacts associated with nighttime lighting, light spillage onto adjacent properties, and glare to a less than significant level.

These impacts would be similar with the Increased Density Alternative as this alternative is located on the same site and would have similar uses. The impacts to the existing visual quality and of light and glare would be similar to the proposed Project as the majority of the Project site would be developed with the same uses as under the proposed Project, just at a higher density. However, this alternative would cluster the residential in the central and eastern portions of the Project site at increased densities to allow for an increase in park areas in the western portion of the Plan Area. Due to the increase in park areas, clustering of urban uses, the Increased Density Alternative would have a reduced impact on visual resources when compared to the proposed Project.

Agricultural Resources

Currently, the majority of the Project site is used for agricultural purposes. Under the Increased Density Alternative, the total development footprint would be equal to the proposed Project. As such, an equal amount of the Project site would be converted from agricultural use to urban use.

As such, this alternative would have equal the impacts to agricultural lands when compared to the proposed Project. It is noted that the loss of the agricultural land, including Prime Farmland, would be a significant and unavoidable impact under both the Increased Density Alternative and the proposed Project. Overall, the Increased Density Alternative would have similar impacts on agricultural resources when compared to the proposed Project.

Air Quality

As described in Section 3.3, San Joaquin County has a State designation Attainment or Unclassified for all criteria pollutants except for ozone, PM_{10} and $PM_{2.5}$. San Joaquin County has a national designation of either Unclassified or Attainment for all criteria pollutants except for Ozone and $PM_{2.5}$. Table 3.3-2 in Section 3.3 presents the state and federal attainment status for San Joaquin County.

As discussed in Section 3.3, as shown in Table 3.3-8, the proposed Project's operational criteria pollutant would not exceed the applicable SJVAPCD thresholds of significance for all criteria air pollutants.

The proposed Project is subject to the SJVAPCD Rule 9510 (Indirect Source Rule [ISR]), which could result in substantial mitigation of NO_X and associated ROG emissions. The reductions are accomplished by the incorporation of mitigation measures into projects and/or by the payment of an Indirect Source Rule fee for any required reductions that have not been accomplished through Project mitigation commitments.

Implementation of the proposed Project would cause an increase in criteria air pollutants, and area and mobile source emissions are the dominant sources of air emissions associated with the proposed Project. Under the Increased Density Alternative, the proposed Project would be developed with the same components as described in the Project Description, but the density of the residential uses would be increased, and the residential areas would be clustered in the central and eastern portions of the Plan Area. Additionally, the amount of parkland would increase, while the development footprint would be equal to the proposed Specific Plan. Because construction emissions are directly correlated to the size of the construction footprint, the construction-related emissions would be similar under this alternative when compared to the proposed Project.

The total operational development, including residential units, would be equal to the proposed Project. However, the trip rate for medium and high density residential units is less than for low density residential units. Under the Increased Density Alternative, the same number of residential units as the proposed Project would be constructed. However, this alternative would include development of 50% percent medium and high density units, and 50% percent low density units. Therefore, the amount of traffic generated from the Project site would be reduced under this alternative and the proposed Project. Similar to the proposed Project, transit would be provided to the site. Mobile source air emissions are directly correlated to traffic volume; therefore, it is estimated that the increased trip volume would result in an increased amount of the mobile source emissions. It is noted that the area source emissions would be similar to the Project.

Overall, the Increased Density Alternative would result in reduced air emissions when compared to the proposed Project.

Biological Resources

As described in Section 3.4, Biological Resources, construction on the Project site has the potential to result in impacts to special-status species in the region. The Project site provides potential habitat for several species, including those discussed in Section 3.4. Through the implementation of various mitigation measures found in Section 3.4, implementation of the proposed Project will have a less than significant impact on biological resources.

The Increased Density Alternative would result in development of the same area as the proposed Specific Plan, but the residential densities would be increased. Under this alternative, the residential areas would be clustered throughout the central and eastern portions of the Project site at increased densities to allow for an increase in park areas. Depending on the location, the increase in park areas could continue to provide habitat (i.e., trees and ball fields) for species. As such, the Increased Density Alternative would result in reduced impacts to biological resources when compared to the proposed Project.

Cultural and Tribal Resources

As discussed in Section 3.5, Cultural and Tribal Resources, there are no historic or cultural resources are known to occur within the Project site. However, there is potential of discovery of previously unknown historic or cultural resources during ground-disturbing activities. Mitigation Measure 3.5-1 and measure 3.5-2 address the potential impacts to historic or cultural resources by requiring and implementing an Archaeological Monitoring Program, whereby the Project proponents shall retain the services of an experienced archaeologist who will be present on-site to observe ground-disturbing activities requiring grubbing, grading, trenching, or excavation; and by conducting pre-construction worker cultural resources sensitivity training. Any previously unknown cultural and/or tribal resources which may be discovered during development of the proposed Project would be required to be preserved, either through preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. Impacts related to substantial adverse changes to a historical resource as defined in CEQA Guidelines §15064.5, a unique archaeological resource as defined in Public Resources Code section 21083.2, or a tribal cultural resource, as defined in Public Resources Code §21074, would be significant and unavoidable with mitigation. Impacts related to disturbance of human remains, including those interred outside of formal cemeteries, would be less than significant with mitigation.

The Increased Density Alternative would result in development of the entire Project site, but the residential densities would be increased and the amount of parkland would be increased. Under this alternative, the same amenities and uses would be developed, and the total disturbance area would be equal to the Project. This would result in an equal potential to disturb or destroy cultural, tribal, historic, and archaeological resources. The proposed Project is not anticipated to result in significant impacts to cultural resources with mitigation; the Increased Density Alternative would result in an equal potential for impacts to cultural resources.

Geology and Soils

As described in Section 3.6, implementation of the proposed Project would result in the construction of new structures on the Project site. The new structures would be subject to seismic, geologic, and soils hazards for the life of the Project. Mostly notably, the proposed Project would be subject to liquefaction, liquefaction induced settlement, and lateral spreading. The Project would be required to comply with the provisions of the CBSC, which includes design requirements to mitigate the effects of potential hazards associated with seismic ground shaking. Further, the Project would be reviewed by the City for conformance with the General Plan, Municipal Code, and other regulations that address seismic safety issues and would be required to comply with standard engineering and seismic safety design considerations to minimize potential impacts. Conformance with the CBSC, General Plan, Municipal Code, and other regulations address construction activities and soil erosion.

Under the Increased Density Alternative, the amount of developed area would be equal to the Project, and an equal number of structures would be subject to hazardous geological conditions. Because this alternative would have an equal disturbance area as the proposed Project , this alternative would result in an equal potential for loss of topsoil and soil erosion compared to the Project. The proposed Project is not anticipated to result in significant impacts from geology and soils with mitigation; the Increased Density Alternative would result in an equal potential for impacts related to geology and soils when compared to the proposed Project.

Greenhouse Gases, Climate Change, and Energy

As stated previously, greenhouse gas emissions from a single Project will not cause global climate change; however, greenhouse gas emission from multiple projects throughout a region or state could result in a cumulative impact with respect to global climate change.

Implementation of the proposed Project would generate GHG emissions that would not otherwise exist without the proposed Project, although, as the California Supreme Court has said, “the future residents and occupants of development enabled by Project approval would exist and live somewhere else if this Project is not approved. Whether ‘here or there,’ GHG emissions associated with such population growth will occur.” (*Center for Biological Diversity v. California Department of Fish and Wildlife* (2015) 62 Cal.4th 204, 219.) Short-term construction emissions of GHGs are estimated at a maximum of approximately 1,661 MT CO_2e per year. The annual unmitigated GHG emissions associated with the proposed Project would be approximately 12,187 MT CO_2e. The proposed Project would not conflict with any of the GHG reduction measures contained with the CARB's 2022 Scoping Plan Update and the SJCOG’s 2022 RTP/SCS, as provided above. Therefore, the proposed Project would be consistent with the State GHG reduction targets, and would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The proposed Project’s criteria pollutant emissions would be considered to have a less than significant impact.

Under the Increased Density Alternative, the Project site would be developed with the same types of uses and structures as the proposed Project, but the residential densities would increase and the amount of parkland would increase. Under the Increased Density Alternative, the same number of residential units as the proposed Project would be constructed. However, this alternative would include development of 50 percent medium and high density units, and 50 percent low density units. Therefore, the amount of traffic generated from the Project site would be reduced under this alternative and the proposed Project. The decreased traffic would result in a decrease in mobile emissions.

The decrease in low density residential units and associated increase in medium and high density residential units would result in an increased level of operational greenhouse gas emissions when compared to the proposed Project. Because construction greenhouse gas emissions are directly correlated to the size of the construction footprint, the construction-related emissions would be equal under this alternative when compared to the proposed Project. As such, the greenhouse gas emissions impact would be equal when compared to the proposed Project.

Hazards and Hazardous Materials

The proposed Project includes components which will likely use a variety of common household hazardous materials including: paints, cleaners, and cleaning solvents. There will be a risk of release of these materials into the environment if they are not stored and handled in accordance with best management practices approved by the San Joaquin County Environmental Health Department and the Lathrop Manteca Fire Protection District.

Under the Increased Density Alternative, the range of residential on the site would not change when compared to the proposed Project. This alternative would still use the hazardous materials identified under the proposed Project. As such, this alternative would have equal impacts from hazards and hazardous materials impacts when compared to the proposed Project.

Hydrology and Water Quality

As described in Section 3.9, with the design and construction of improvements included in the proposed storm drainage system, the proposed Project would not increase peak stormwater runoff. The proposed Project, along with several of the related projects within the City of Lathrop, would ultimately discharge stormwater runoff to on-site detention basins, the City's system laterals, the San Joaquin River, or the groundwater basin. This would potentially degrade the water quality of the system. The proposed Project would not cause the substantial depletion of groundwater supplies or interfere substantially with groundwater recharge, or result in significant impacts related to flooding.

Under the Increased Density Alternative, potential construction-related and long-term operational impacts to water quality or waste discharge related to stormwater runoff would be comparable to the proposed Project. However, this alternative would increase the amount of parkland compared to the proposed Project. The increase in parkland under this alternative would remain pervious to precipitation, which would facilitate groundwater recharge and the natural biofiltration of stormwater. This alternative would still include stormwater detention/basins, and provide natural BMPs to reduce pollutants in stormwater runoff. As such, potential impacts related to hydrology and water quality would be reduced under the Increased Density Alternative when compared to the proposed Project.

Land Use, Population, and Housing

The Project would directly introduce new residents to the City as housing is proposed as part of the Project. The Project would require a zoning and general plan amendment for land use changes. However, impacts to land use, population and housing are considered less than significant.

Under the Increased Density Alternative, the same number of residential units as the proposed Project (up to 912 units) would be constructed. However, this alternative would include development of 50 percent low density units (up to 456 units), 30 percent medium density units (up to 274 units) and high density units (up to 182 units). Therefore, because the number of housing units developed under this alternative would be equal to the Project, impacts relating to population would be equal under this alternative. Like the Project, the Reduced Density Alternative would be inconsistent with the General Plan and zoning designations for the site and a General Plan amendment and rezone would be required. Overall, the impacts related to land use and population under this alternative would be equal when compared to the proposed Project.

Noise

The proposed Project could increase noise-generating activities associated with the maintenance and operation of the proposed Project, as well as from vehicular traffic. Mitigation measures provided in Section 3.11 would reduce nearly all potential impacts to a less than significant level.

The Increased Density Alternative would result in the same number of residential units as the Project; therefore, the noise impacts associated with the alternative would be equal to the vehicular and operational activities of the proposed Project. All noise issues would be mitigated, as appropriate, through noise attenuation and best management practices; therefore, under this alternative, noise impacts would be equal when compared to the proposed Project.

Public Services and Recreation

Development in the Plan Area will be required to pay all applicable fees and assessments required to fund its fair share of public services and recreation. This funding would assist in the development of facilities in order to meet the City's standards. The proposed Project would have a less than significant impact to fire, police, and schools. Impacts related to recreational facilities would be significant and unavoidable under the Project.

Under the Increased Density Alternative, the majority of the site would be developed with the same range of allowable uses as described in the Project Description, and the size of the residential components would be equal. Due to the similar population growth anticipated as a result of the Project and the Increased Density Alternative, the demand for fire protection, police protection, schools, and recreational facilities would be similar to the Project. As such, public services and recreation impacts would be equal when compared to the proposed Project.

Transportation and Circulation

As described in Section 3.14, for VMT forecasting, the City of Lathrop states that for a project to be VMT insignificant, the project has to generate 15 percent below the Citywide average for the total home-based residential VMT per capita statistic.

Adding in the Project lowers the home-based VMT per capita for the TAZ to 16.45. As the citywide average for Lathrop for home-based VMT per capita is 18.17, the significance criteria (15 percent under the citywide average) would be 15.44. Without incorporating proposed features which would reduce VMT (discussed below), the Project's VMT per capita value of 16.29 is higher than the citywide threshold of 15.44.

To ensure the Project would result in a VMT per capita which is below threshold, a decrease of 6.14 percent (or 1.01 VMT per capita) would be required for the Project. As part of the proposed Project, the improved pedestrian network which would include pedestrian walkways along all local streets and connect into the existing pedestrian network would reduce VMT up to 5.7 percent. Additionally, the Project design implements traffic calming measures and low stress bicycle facilities, including Class II bike lanes along the proposed arterial and collector streets and a multi-use trail along the San Joaquin River which would reduce VMT up to 1.7 percent. These Project design features would reduce VMT for the Project a total of 7.4 percent. With the proposed Project design features, the Project's VMT per capita would be more than 15 percent below the Citywide average for the total home-based residential VMT per capita statistic.

As noted above, the total development, including residential units would be equal to the proposed Project under this alternative. However, the trip rate for medium and high density residential units is less than for low density residential units. Under the Increased Density Alternative, the same number of residential units as the proposed Project would be constructed. However, this alternative would include development of 50% percent medium and high density units, and 50% percent low density units. Therefore, the amount of traffic generated from the Project site, and thus total VMT, would be reduced under this alternative and the proposed Project. Uses in the Increased Density Alternative would be required to adhere to the same mitigation measures as the proposed Project; therefore, under this alternative, transportation and circulation impacts would be reduced when compared to the proposed Project.

Utilities

Implementation of the proposed Project would result in increased flows to the public wastewater system. The wastewater system can handle the increased flows with their existing permit and infrastructure.

Implementation of the proposed Project would result in increased demand for potable water. The technical analyses shows that the total projected water supplies determined to be available for the proposed Project during normal, single dry, and multiple dry years through 2040 will meet the projected water demand associated with the proposed Project, in addition to existing and planned future uses. However, supply shortfalls of three percent (450 AF) are projected to occur in 2045 for single dry years and the third and fourth years of a multiple dry year period. It should be noted that similar to Project conditions, under existing conditions (i.e., without Project implementation), the 2020 UWMP projects that the City will experience supply shortfalls (314 AF or two percent) in 2045 during single dry years and third and fourth years of a multiple dry year period. If supply shortfalls do occur, the City expects to meet these supply shortfalls through water demand reductions and other shortage response actions by implementing its WSCP, in addition to a number of strategies and actions to minimize the potential for water supply shortfalls. Nevertheless, there would be a projected supply shortfall in 2045 for single dry years and the third and fourth years of a multiple dry year period. The impact would remain significant and unavoidable.

Implementation of the proposed Project would result in increased storm drainage from new impervious surfaces. The proposed Project includes a storm drainage collection system to handle the increased storm drainage.

Implementation of the proposed Project would result in increased generation of solid waste. However, the landfill has adequate capacity to dispose the solid waste.

Further, the proposed Project would not result in the relocation or construction of new or expanded electrical, and telecommunications facilities, the construction or relocation of which could cause significant environmental effects.

Under the Increased Density Alternative, the proposed Project would be developed with the same components as described in the Project Description, and the size of the residential would be equal. The residential areas would be clustered throughout the Project site at increased densities to allow for a decrease in the total development area. Typical single-family residential (Low Density) is estimated to generate roughly 10 pounds of solid waste per day per household. Typical multi-family residential (Medium and High Density) is estimated to generate roughly 5.31 pounds of solid waste per day per household. Under the Increased Density Alternative, the same number of residential units as the proposed Project would be constructed. However, this alternative would include development of 50% percent medium and high density units, and 50% percent low density units. Because this alternative would increase the amount of medium and high density residential units and decrease the amount of low density residential units compared to the proposed Project, the associated solid waste generation for the residential areas would decrease. Overall, solid waste generation from this alternative would decrease.

Water and wastewater demand factors for low density residential units are typically higher than the water demand factors for both medium and high density residential units. Similar to solid waste, because this alternative would increase the amount of medium and high density residential units and decrease the amount of low density residential units compared to the proposed Project, the associated water demand and wastewater generation would for the residential areas would increase. Additionally, because the park areas would increase compared to the proposed Project as a result of the clustering of residential areas, the park area wastewater generation would increase. Overall, the wastewater generation would increase compared to the proposed Project.

Overall, this alternative would have increased wastewater treatment demand, similar water demand, decreased solid waste generated, and similar storm water runoff when compared to the proposed Project. As such, this alternative would have equal impacts when compared to the proposed Project.

LOWER DENSITY ALTERNATIVE

Aesthetics and Visual Resources

As described in Section 3.1, the visual character of the Project site would be significantly altered as a result of Project implementation. Implementation of the proposed Design Guidelines and landscaping requirements, and consistency with the General Plan and the Lathrop Zoning Ordinance, would ensure that impacts are reduced to the greatest extent possible.

The proposed Project lighting would be required to incorporate design features, consistent with Lathrop General Plan, to minimize the effects of light and glare, and material selections aimed to limit light and glare. Implementation of the Specific Plan requirements and standards in conjunction with the Lathrop General Plan and municipal code standards for lighting would reduce potential impacts associated with nighttime lighting, light spillage onto adjacent properties, and glare to a less than significant level.

Under the Lower Density Alternative, portions of the Project site that are currently agricultural land would be converted to urban uses. As such, there would still be an impact to the visual character under this alternative. The impact associated with increased light and glare in the developed area would be mitigated. Under this alternative, the changes to the existing visual quality would be similar to the proposed Project as the entire site would be developed with the same amount of residential uses. As such, this alternative would have similar impacts as the proposed Project.

Agricultural Resources

Currently, the majority of the Project site is used for agricultural purposes. While this alternative would promote larger lot sizes and reduce the number of residential units compared to the Project, the entire Project site would still be converted from agricultural use. As such, this alternative would not reduce the impacts to agricultural lands when compared to the proposed Project. The loss of the agricultural land, including Prime Farmland, would be a significant and unavoidable impact under both the Lower Density Alternative and the proposed Project. Therefore, the Lower Density Alternative would have equal impacts on agricultural resources when compared to the proposed Project.

Air Quality

As described in Section 3.3, San Joaquin County has a State designation Attainment or Unclassified for all criteria pollutants except for ozone, PM_{10} and $PM_{2.5}$. San Joaquin County has a national designation of either Unclassified or Attainment for all criteria pollutants except for Ozone and $PM_{2.5}$. Table 3.3-2 in Section 3.3 presents the state and federal attainment status for San Joaquin County.

As discussed in Section 3.3, as shown in Table 3.3-8, the proposed Project's operational criteria pollutant would not exceed the applicable SJVAPCD thresholds of significance for all criteria air pollutants.

The proposed Project is subject to the SJVAPCD Rule 9510 (Indirect Source Rule [ISR]), which could result in substantial mitigation of NO_X and associated ROG emissions. The reductions are accomplished by the incorporation of mitigation measures into projects and/or by the payment of an Indirect Source Rule fee for any required reductions that have not been accomplished through Project mitigation commitments.

Implementation of the proposed Project would cause an increase in criteria air pollutants, and area and mobile source emissions are the dominant sources of air emissions associated with the proposed Project. Under the Lower Density Alternative, the number of residential units constructed in the Plan Area would be reduced by 25 percent compared to the proposed Project. Therefore, the amount of traffic generated from the Project site would be reduced under this alternative and the proposed Project. Mobile source air emissions are directly correlated to traffic volume; therefore, it is estimated that the reduced trip volume would result in a reduced amount of mobile source emissions. Additionally, the area source emissions would be reduced compared to the Project.

The Lower Density Alternative would result in reduced air emissions when compared to the proposed Project.

Biological Resources

As described in Section 3.4, Biological Resources, construction on the Project site has the potential to result in impacts to special-status species in the region. The Project site provides potential habitat for several species, including those discussed in Section 3.4. Through the implementation of various mitigation measures found in Section 3.4, implementation of the proposed Project will have a less than significant impact on biological resources.

The Lower Density Alternative would result in development of the entire Project site. Under this alternative, the same amenities and uses would be developed. As such, the Lower Density Alternative would result in similar impacts to biological resources when compared to the proposed Project.

Cultural and Tribal Resources

As discussed in Section 3.5, Cultural and Tribal Resources, there are no historic or cultural resources are known to occur within the Project site. However, there is potential of discovery of previously unknown historic or cultural resources during ground-disturbing activities. Mitigation Measure 3.5-1 and measure 3.5-2 addresses the potential impacts to historic or cultural resources by requiring and implementing an Archaeological Monitoring Program, whereby the Project proponents shall retain the services of an experienced archaeologist who will be present on-site to observe ground-disturbing activities requiring grubbing, grading, trenching, or excavation; and by conducting pre-construction worker cultural resources sensitivity training. Any previously unknown cultural and/or tribal resources which may be discovered during development of the proposed Project would be required to be preserved, either through preservation in place, excavation, documentation, curation, data recovery, or other appropriate measures. Impacts related to substantial adverse changes to an historical resource as defined in CEQA Guidelines §15064.5, a unique archaeological resource as defined in Public Resources Code section 21083.2, or a tribal cultural resource, as defined in Public Resources Code §21074, would be significant and unavoidable with mitigation. Impacts related to disturbance of human remains, including those interred outside of formal cemeteries, would be less than significant with mitigation.

The Lower Density Alternative would result in development of the entire Project site, but a reduction in density of the residential areas. Under this alternative, the same amenities and uses would be developed. This would result in a similar potential to disturb or destroy cultural, tribal, historic, and archaeological resources. While the proposed Project is not anticipated to result in significant impacts to cultural resources with mitigation, the Lower Density Alternative would result in a similar potential for impacts to cultural resources.

Geology and Soils

As described in Section 3.6, implementation of the proposed Project would result in the construction of new structures on the Project site. The new structures would be subject to seismic, geologic, and soils hazards for the life of the Project. Mostly notably, the proposed Project would be subject to liquefaction, liquefaction induced settlement, and lateral spreading. The Project would be required to comply with the provisions of the CBSC, which includes design requirements to mitigate the effects of potential hazards associated with seismic ground shaking. Further, the Project would be reviewed by the City for conformance with the General Plan, Municipal Code, and other regulations that address seismic safety issues and would be required to comply with standard engineering and seismic safety design considerations to minimize potential impacts. Conformance with the CBSC, General Plan, Municipal Code, and other regulations address construction activities and soil erosion.

Under the Lower Density Alternative, the amount of developed area would be similar to the Project, but a reduced number of structures would be subject to hazardous geological conditions. While the proposed Project is not anticipated to result in significant impacts from geology and soils with mitigation, the Lower Density Alternative would result in reduced potential for impacts when compared to the proposed Project.

Greenhouse Gases, Climate Change, and Energy

As stated previously, greenhouse gas emissions from a single Project will not cause global climate change; however, greenhouse gas emission from multiple projects throughout a region or state could result in a cumulative impact with respect to global climate change.

Implementation of the proposed Project would generate GHG emissions that would not otherwise exist without the proposed Project, although, as the California Supreme Court has said, “the future residents and occupants of development enabled by Project approval would exist and live somewhere else if this Project is not approved. Whether ‘here or there,’ GHG emissions associated with such population growth will occur." (*Center for Biological Diversity v. California Department of Fish and Wildlife* (2015) 62 Cal.4th 204, 219.) Short-term construction emissions of GHGs are estimated at a maximum of approximately 1,661 MT CO_2e per year. The annual unmitigated GHG emissions associated with the proposed Project would be approximately 12,187 MT CO_2e. The proposed Project would not conflict with any of the GHG reduction measures contained with the CARB's 2022 Scoping Plan Update and the SJCOG's 2022 RTP/SCS, as provided above. Therefore, the proposed Project would be consistent with the State GHG reduction targets, and would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment or to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The proposed Project's criteria pollutant emissions would be considered to have a less than significant impact.

Under the Lower Density Alternative, the Project site would be developed with the same types of uses and structures as the proposed Project, but the number and density of residential units would decrease. The reduced number of residential units would result in a corresponding reduced level of greenhouse gas emissions when compared to the proposed Project. As such, the greenhouse gas emissions impacts would be reduced when compared to the proposed Project.

Hazards and Hazardous Materials

The proposed Project includes components which will likely use a variety of common household hazardous materials including: paints, cleaners, and cleaning solvents. There will be a risk of release of these materials into the environment if they are not stored and handled in accordance with best management practices approved by the San Joaquin County Environmental Health Department and the Lathrop Manteca Fire Protection District.

Under the Lower Density Alternative, the range of residential uses on the site would not change when compared to the proposed Project. This alternative would still use the hazardous materials identified under the proposed Project. As such, this alternative would have equal impacts from hazards and hazardous materials impacts when compared to the proposed Project.

Hydrology and Water Quality

As described in Section 3.9, with the design and construction of improvements included in the proposed storm drainage system, the proposed Project would not increase peak stormwater runoff. The proposed Project, along with several of the related projects within the City of Lathrop, would ultimately discharge stormwater runoff to on-site detention basins, the City's system laterals, the San Joaquin River, or the groundwater basin. This would potentially degrade the water quality of the system. The proposed Project would not cause the substantial depletion of groundwater supplies or interfere substantially with groundwater recharge, or result in significant impacts related to flooding.

Under the Lower Density Alternative, potential construction-related and long-term operational impacts to water quality or waste discharge related to stormwater runoff would be comparable to the proposed Project. The increased areas of lot sizes and associated front and backyard areas under this alternative will remain pervious to precipitation, which will facilitate groundwater recharge and the natural biofiltration of stormwater. This alternative would still include stormwater detention/basins, and provide natural BMPs to reduce pollutants in stormwater runoff. As such, potential impacts related to hydrology and water quality would be reduced under the Lower Density Alternative when compared to the proposed Project.

Land Use, Population, and Housing

The Project would directly introduce new residents to the City as housing is proposed as part of the Project. The Project would require a zoning and general plan amendment for land use changes. However, impacts to land use, population and housing are considered less than significant.

Under the Lower Density Alternative, the number of residential units constructed in the Plan Area would be reduced by 25 percent compared to the proposed Project. Because fewer units would be constructed, the resulting population would also decrease compared to the Project. Like the Project, the Lower Density Alternative would be inconsistent with the General Plan and zoning designations for the site and a General Plan amendment and rezone would be required. Overall, the impacts related to land use and population under this alternative would be slightly reduced when compared to the proposed Project.

Noise

The proposed Project could increase noise-generating activities associated with the maintenance and operation of the proposed Project, as well as from vehicular traffic. Mitigation measures provided in Section 3.11 would reduce nearly all potential impacts to a less than significant level.

The Lower Density Alternative would result in a 25 percent reduction in the number of residential units as the Project; therefore, the vehicular and operational noise impacts associated with the alternative would be reduced compared to the proposed Project. All noise issues would be mitigated, as appropriate, through noise attenuation and best management practices; therefore, under this alternative, noise impacts would be reduced when compared to the proposed Project.

Public Services and Recreation

Development in the Plan Area will be required to pay all applicable fees and assessments required to fund its fair share of public services and recreation. This funding would assist in the development of facilities in order to meet the City's standards. The proposed Project would have a less than significant impact to fire, police, and schools. Impacts related to recreational facilities would be significant and unavoidable under the Project.

Under the Lower Density Alternative, the site would be developed with the same range of allowable uses as described in the Project Description, and a reduced number of residential units. Due to the reduced population growth anticipated as a result of this alternative, the demand for fire protection, police protection, schools, and recreational facilities would be reduced compared to the Project. As such, this impact would be reduced compared to the proposed Project.

Transportation and Circulation

As described in Section 3.14, for VMT forecasting, the City of Lathrop states that for a project to be VMT insignificant, the project has to generate 15 percent below the Citywide average for the total home-based residential VMT per capita statistic.

Adding in the Project lowers the home-based VMT per capita for the TAZ to 16.45. As the citywide average for Lathrop for home-based VMT per capita is 18.17, the significance criteria (15 percent under the citywide average) would be 15.44. Without incorporating proposed features which would reduce VMT (discussed below), the Project's VMT per capita value of 16.29 is higher than the citywide threshold of 15.44.

To ensure the Project would result in a VMT per capita which is below threshold, a decrease of 6.14 percent (or 1.01 VMT per capita) would be required for the Project. As part of the proposed Project, the improved pedestrian network which would include pedestrian walkways along all local streets and connect into the existing pedestrian network would reduce VMT up to 5.7 percent. Additionally, the Project design implements traffic calming measures and low stress bicycle facilities, including Class II bike lanes along the proposed arterial and collector streets and a multi-use trail along the San Joaquin River which would reduce VMT up to 1.7 percent. These Project design features would reduce VMT for the Project a total of 7.4 percent. With the proposed Project design features, the Project's VMT per capita would be more than 15 percent below the Citywide average for the total home-based residential VMT per capita statistic.

Under the Lower Density Alternative, the number of residential units constructed in the Plan Area would be reduced by 25 percent compared to the proposed Project. This alternative would also plan for parks, trails, circulation improvements, and utility improvements. Due to the 25 percent reduction in residential units, the amount of traffic generated from the Project site would be reduced under this alternative and the proposed Project. Therefore, under this alternative, transportation and circulation impacts would be reduced when compared to the proposed Project.

Utilities

Implementation of the proposed Project would result in increased flows to the public wastewater system. The wastewater system can handle the increased flows with their existing permit and infrastructure.

Implementation of the proposed Project would result in increased demand for potable water. The technical analyses shows that the total projected water supplies determined to be available for the proposed Project during normal, single dry, and multiple dry years through 2040 will meet the projected water demand associated with the proposed Project, in addition to existing and planned future uses. However, supply shortfalls of three percent (450 AF) are projected to occur in 2045 for single dry years and the third and fourth years of a multiple dry year period. It should be noted that similar to Project conditions, under existing conditions (i.e., without Project implementation), the 2020 UWMP projects that the City will experience supply shortfalls (314 AF or two percent) in 2045 during single dry years and third and fourth years of a multiple dry year period. If supply shortfalls do occur, the City expects to meet these supply shortfalls through water demand reductions and other shortage response actions by implementing its WSCP, in addition to a number of strategies and actions to minimize the potential for water supply shortfalls. Nevertheless, there would be a projected supply shortfall in 2045 for single dry years and the third and fourth years of a multiple dry year period. The impact would remain significant and unavoidable.

Implementation of the proposed Project would result in increased storm drainage from new impervious surfaces. The proposed Project includes a storm drainage collection system to handle the increased storm drainage.

Implementation of the proposed Project would result in increased generation of solid waste. However, the landfill has adequate capacity to dispose the solid waste.

Further, the proposed Project would not result in the relocation or construction of new or expanded electrical, and telecommunications facilities, the construction or relocation of which could cause significant environmental effects.

Under the Lower Density Alternative, the number of residential units constructed in the Plan Area would be reduced by 25 percent compared to the proposed Project. This alternative would also plan for parks, trails, circulation improvements, and utility improvements.

Typical single-family residential (Low Density) is estimated to generate roughly 10 pounds of solid waste per day per household. Typical multi-family residential (Medium and High Density) is estimated to generate roughly 5.31 pounds of solid waste per day per household. Because this alternative would reduce the number of residential units by 25 percent, the associated solid waste generation for the residential areas would decrease. Overall, solid waste generation from this alternative would decrease.

Water and wastewater demand factors for low density residential units are typically higher than the water demand factors for both medium and high density residential units. Similar to solid waste, because this alternative would reduce the number of residential units by 25 percent, the associated water demand and wastewater generation for the residential areas would decrease.

Under the Lower Density Alternative, the proposed Project would be developed in such a way to promote larger lot sizes and to reduce the overall footprint of the developed areas. The increased front and backyard areas would result in more acres of pervious soils, thereby increasing opportunities for stormwater retention at the Project site.

Overall, this alternative would have reduced wastewater treatment demand, water demand, solid waste generation, and storm water runoff when compared to the proposed Project. As such, this alternative would have reduced impacts when compared to the proposed Project.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires that an environmentally superior alternative be identified among the alternatives that are analyzed in the EIR. If the No Project (No Build) Alternative is the environmentally superior alternative, an EIR must also identify an environmentally superior alternative among the other alternatives (CEQA Guidelines Section 15126.6(e)(2)). The environmentally superior alternative is that alternative with the least adverse environmental impacts when compared to the proposed Project.

As Table 5.0-1 presents a comparison of the impacts from the proposed Project relative to the Alternatives. As shown in the table, the No Project (No Build) Alternative is the environmentally superior alternative. However, as required by CEQA, when the No Project (No Build) Alternative is the environmentally superior alternative, the environmentally superior alternative among the others must be identified. The Increased Density Alternative would reduce impacts related to 25 impact statements, increase impacts related to one impact statement, and equal impacts related to 40 impact statements. The Lower Density Alternative would reduce impacts related to 31 impact statements and would have equal impacts related to 36 impact statements. Therefore, the Lower Density Alternative would be the next environmentally superior alternative.

See Section 5.4 for a comparative evaluation of the objectives for each alternative.

TABLE 5.0-1: COMPARISON OF ALTERNATIVE PROJECT IMPACTS TO THE PROPOSED PROJECT

Environmental Topic	*Proposed Project*[1]	*No Project (No Build) Alternative*	*Increased Density Alternative*	*Lower Density Alternative*
Section 3.1 - Aesthetics (AES)				
AES Impact 3.1-1	LS	Less	Equal	Equal
AES Impact 3.1-2	LS	Less	Less	Equal
AES Impact 3.1-3	LS	Less	Less	Equal
AES Impact 3.1-4	LS	Less	Less	Equal
Section 3.2 – Agricultural Resources (AG)				
AG Impact 3.2-1	SU	Less	Equal	Equal
AG Impact 3.2-2	SU	Less	Equal	Equal
AG Impact 3.2-3	LS	Less	Equal	Equal
Section 3.3 - Air Quality (AQ)				
AQ Impact 3.3-1	LS	Less	Less	Less
AQ Impact 3.3-2	LS	Less	Less	Less
AQ Impact 3.3-3	LS	Less	Equal	Equal
AQ Impact 3.3-4	LS	Less	Less	Less
AQ Impact 3.3-5	LS	Less	Equal	Equal
Section 3.4 - Biological Resources (BIO)				
BIO Impact 3.4-1	LS/MM	Less	Less	Equal
BIO Impact 3.4-2	LS/MM	Less	Less	Equal
BIO Impact 3.4-3	LS/MM	Less	Less	Equal
BIO Impact 3.4-4	LS/MM	Less	Less	Equal
BIO Impact 3.4-5	LS	Less	Less	Equal
BIO Impact 3.4-6	LS	Less	Less	Equal
BIO Impact 3.4-7	NI	Less	Equal	Equal
BIO Impact 3.4-8	NI	Less	Equal	Equal
BIO Impact 3.4-9	LS	Less	Equal	Equal
BIO Impact 3.4-10	LS/MM	Less	Less	Equal
BIO Impact 3.4-11	LS/MM	Less	Less	Equal
Section 3.5 - Cultural and Tribal Resources (CLT)				
CLT Impact 3.5-1	LS/MM	Less	Equal	Equal
CLT Impact 3.5-2	LS/MM	Less	Equal	Equal
CLT Impact 3.5-3	LS	Less	Equal	Equal
CLT Impact 3.5-4	LS/MM	Less	Equal	Equal

ENVIRONMENTAL TOPIC	*PROPOSED PROJECT*[1]	*NO PROJECT (NO BUILD) ALTERNATIVE*	*INCREASED DENSITY ALTERNATIVE*	*LOWER DENSITY ALTERNATIVE*
SECTION 3.6 - GEOLOGY AND SOILS (GEO)				
GEO Impact 3.6-1	LS	Less	Equal	Less
GEO Impact 3.6-2	LS	Less	Equal	Less
GEO Impact 3.6-3	LS	Less	Equal	Less
GEO Impact 3.6-4	LS	Less	Equal	Less
GEO Impact 3.6-5	LS	Less	Equal	Equal
SECTION 3.7 - GREENHOUSE GASES, CLIMATE CHANGE AND ENERGY (GHG)				
GHG Impact 3.7-1	LS	Less	Equal	Less
GHG Impact 3.7-2	LS	Less	Equal	Less
SECTION 3.8 - HAZARDS AND HAZARDOUS MATERIALS (HAZ)				
HAZ Impact 3.8-1	LS	Less	Equal	Equal
HAZ Impact 3.8-2	LS/MM	Less	Equal	Equal
HAZ Impact 3.8-3	N	Less	Equal	Equal
HAZ Impact 3.8-4	N	Less	Equal	Equal
HAZ Impact 3.8-5	N	Less	Equal	Equal
HAZ Impact 3.8-6	LS	Less	Equal	Equal
SECTION 3.9 - HYDROLOGY AND WATER QUALITY (HYD)				
HYD Impact 3.9-1	LS	Less	Less	Less
HYD Impact 3.9-2	LS	Less	Less	Less
HYD Impact 3.9-3	LS	Less	Less	Less
HYD Impact 3.9-4	LS	Less	Less	Less
HYD Impact 3.9-5	LS	Less	Less	Less
SECTION 3.10 - LAND USE, POPULATION AND HOUSING (LUPH)				
LUPH Impact 3.10-1	LS	Equal	Equal	Equal
LUPH Impact 3.10-2	LS	Equal	Equal	Equal
LUPH Impact 3.10-3	LS	Less	Equal	Less
SECTION 3.11 - NOISE (NOI)				
NOI Impact 3.11-1	LS/MM	Less	Equal	Less
NOI Impact 3.11-2	LS	Less	Equal	Less
SECTION 3.12 - PUBLIC SERVICES AND RECREATION (PSR)				
PS Impact 3.12-1	LS	Less	Equal	Less
PS Impact 3.12-2	LS	Less	Equal	Less
PS Impact 3.12-3	LS	Less	Equal	Less

ENVIRONMENTAL TOPIC	*PROPOSED PROJECT*[1]	*NO PROJECT (NO BUILD) ALTERNATIVE*	*INCREASED DENSITY ALTERNATIVE*	*LOWER DENSITY ALTERNATIVE*
PS Impact 3.12-4	LS	Less	Equal	Less
PS Impact 3.12-5	LS	Less	Equal	Less
SECTION 3.13 - TRANSPORTATION AND CIRCULATION (TC)				
TC Impact 3.13-1	LS	Less	Less	Less
TC Impact 3.13-2	LS	Less	Less	Less
TC Impact 3.13-3	LS	Less	Less	Less
TC Impact 3.13-4	LS	Less	Less	Less
SECTION 3.14 - UTILITIES (UTL)				
UT Impact 3.14-1	LS	Less	Equal	Equal
UT Impact 3.14-2	SU	Less	Greater	Less
UT Impact 3.14-3	LS	Less	Equal	Equal
UT Impact 3.14-4	LS	Less	Less	Less
UT Impact 3.14-5	LS	Less	Equal	Less
UT Impact 3.14-6	LS	Less	Less	Less
UT Impact 3.14-7	LS	Less	Equal	Equal

5.4 COMPARATIVE EVALUATION OF THE ALTERNATIVES' ABILITY TO SATISFY PROJECT OBJECTIVES

This section examines how each of the alternatives selected for more detailed analysis meets the underlying Project purpose and Project objectives.

> *Underlying Project Purpose: The underlying purpose of the proposed Project is the expansion of the City of Lathrop Sphere of Influence, and approval and subsequent implementation of the Specific Plan as a means of increasing the housing supply in Stanislaus County and the State of California.*

The No Project (No Build) Alternative would not satisfy this Project objective because under this alternative, the City's SOI would not be expanded, and the Specific Plan would not be implemented as a means of increasing the housing supply in San Joaquin County and the State of California. The Increased Density Alternative and Lower Density Alternative would expand the City's SOI and implement a Specific Plan as a means of increasing the housing supply. However, because the Lower Density Alternative would decrease the number of units compared to the Project, the increase in housing supply in San Joaquin County and the State of California would not be as great as the proposed Project.

Goal 1: Complete neighborhoods which foster a mixture of compatibly scaled housing types on urban lots.

The No Project (No Build) Alternative would not satisfy this Project objective because under this alternative, the Project site would remain in its current existing condition and would not provide a mix of residential housing products to accommodate a variety of desires in the market. The Increased Density Alternative would partially meet this objective because this alternative would provide a mix of residential housing products; however, this alternative includes development of 50% medium and high density units, and 50% low density units, while the proposed Project would result in a greater mix and variety of housing types. Similarly, the Lower Density Alternative would not meet this objective because only low density residential units would be provided. The No Reserve Alternative would meet this objective because the variety of housing products would be identical to the proposed Project.

Goal 2: A residential development that will incorporate traditional elements found throughout Central Valley communities including a hierarchy of interconnected streets, the incorporation of assorted architectural styles, tree lined thoroughfares, an emphasis upon pedestrian scale and access with a nod to the agricultural traditions of the Valley.

The No Project (No Build) Alternative would not satisfy this Project objective because under this alternative, the Project site would remain in its current existing condition and would not include any residential development, thereby failing to incorporate the desired traditional community elements such as interconnected streets, diverse architecture, and pedestrian access. Both the Increased Density Alternative and the Lower Density Alternative would meet this objective because the housing types could implement desired design characteristics.

Goal 3: Street patterns which are carefully configured to allow for multiple outlets from neighborhoods, and to provide for connections between neighborhoods, without encouraging through traffic to create convenience and access without a private automobile.

The No Project (No Build) Alternative would not satisfy this Project objective because under this alternative, the Project site would remain in its current existing condition and would not develop interconnected street patterns that promote neighborhood connectivity and reduce dependency on private automobiles. Both the Increased Density Alternative and the Lower Density Alternative would meet this objective because both alternatives would allow for multiple outlets from neighborhoods, and to provide for connections between neighborhoods.

Goal 4: A network of planned walkways and bikeways which make getting outside convenient, easy and enjoyable.

The No Project (No Build) Alternative would not satisfy this objective because under this alternative, pedestrian and bicycle trails, outdoor recreation areas, and opportunities for social interaction would not be provided. Similar to the above discussion for Goal 3, both the Increased Density Alternative and the Lower Density Alternative would meet this objective because both alternatives would develop pedestrian and bicycle trails, outdoor recreation areas, and opportunities for social interaction.

Goal 5: Durable construction materials and designs suited to local conditions to contribute to the ongoing costs of the housing will be encouraged.

The No Project (No Build) Alternative would not satisfy this objective because under this alternative, no new housing would be built, preventing any opportunity to implement these design standards. Similar to the proposed Project, both the Increased Density Alternative and the Lower Density Alternative would meet this objective because they may allow for construction of higher-quality, durable materials and designs tailored to local conditions, potentially lowering long-term housing costs.

Goal 6: Provide a range of housing opportunities to support a diverse population, lifestyles, and family groups.

The No Project (No Build) Alternative would not satisfy this Project objective because under this alternative, the Project site would remain in its current existing condition and would not to support a diverse population, lifestyles, or family group. The Increased Density Alternative and Lower Density Alternative would meet this objective by developing a range of housing types and sizes, accommodating a more diverse population, lifestyles, and family groups.

Goal 7: Establish a planning/zoning concept that is responsive to the market.

The No Project (No Build) Alternative would not achieve this objective because this alternative would not establish any planning or zoning concept that is responsive to the market. The Increased Density Alternative and Lower Density Alternative would meet this objective.

Goal 8: Implement the Phasing Plan for logical development in line with the West Lathrop Specific Plan.

The No Project (No Build) Alternative would not satisfy this Project objective because under this alternative, the Project site would remain in its current existing condition and would not implement the West Lathrop Specific Plan. The Increased Density Alternative and Lower Density Alternative would establish planned residential development accounted for in the West Lathrop Specific Plan and would therefore meet this objective.

Goal 9: Implement City's Infrastructure Master Plans*.*

The No Project (No Build) Alternative would not achieve this objective as it does not facilitate any new development or infrastructure improvements outlined in the City's Infrastructure Master Plans. The Increased Density Alternative and Lower Density Alternative would meet this objective as they would develop infrastructure improvements within capacity of the City's Infrastructure Master Plans.

This page left intentionally blank.

REPORT PREPARERS

City of Lathrop

Rick Caguiat .... Director of Community Development

David Niskanen .... Contract Planner

James Michaels .... Senior Planner

De Novo Planning Group

Steve McMurtry .... Principal Planner/Project Manager

Christine Abraham .... Principal Planner

Elise Laws .... Senior Planner

Josh Smith .... Senior Planner

Ashley Brodkin .... Senior Planner

Erik Anderson .... Associate Planner

TJKM – Traffic Consultant

Steven Matthew Dauterman, PE, TE, PTOE, RSP1 .... Senior Transportation Engineer

Arthur Chen .... Transportation Planner

Saxelby Acoustics – Noise Consultant

Luke Saxelby, INCE Bd. Cert. .... Principal Consultant

Rex Crayne. .... Acoustic and Vibration Engineer

Peak & Associates – Cultural Consultant

Melinda Peak .... Principal Investigator

Robert A. Gerry .... Senior Archeologist

West Yost – Water Supply Consultant

Elizabeth Drayer .... Principal Engineer

Whitney Jones .... Associate Engineer II

This page intentionally left blank.

REFERENCES

California Air Resources Board, 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. Available at: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

California Air Resources Board, 2023. Maps of State and Federal Area Designations. Available: https://ww2.arb.ca.gov/resources/documents/maps-state-and-federal-area-designations. Accessed August 15, 2024.

California Air Resources Board, 2024. California Ambient Air Quality Standards. Available: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards. Accessed August 15, 2024.

California Department of Conservation, California Geological Survey, 2022. California Geomorphic Provinces, Note 36. December. Available: https://www.conservation.ca.gov/cgs/Documents/Publications/CGS-Notes/CGS-Note-36.pdf. Accessed: March 7, 2024.

California Department of Conservation, 2024. Data Viewer: Quaternary Surficial Geology of Southern California. Available: https://maps.conservation.ca.gov/cgs/DataViewer/index.html. Accessed: March 10, 2024.

California Department of Conservation, California Geological Survey, 2024. Landslides. Available: https://www.conservation.ca.gov/cgs/landslides. Accessed: March 10, 2024.

California Department of Conservation (Jennings, C. & Bryant, W.), 2010. California Geological Survey An Explanatory Text to Accompany the Fault Activity Map of California. Available: https://www.conservation.ca.gov/cgs/Documents/Melange/FAM_phamplet.pdf. Accessed: March 7, 2024.

California Department of Conservation, California Geological Survey, 2024. Fault Activity Map of California. Available: https://maps.conservation.ca.gov/cgs/fam/. Accessed: March 7, 2024.

California Department of Conservation, California Geological Survey. 2018 (revised). Earthquake Fault Zones (Special Publication 42). Available: https://www.conservation.ca.gov/cgs/documents/publications/special-publications/SP_042-a11y.pdf. Accessed: March 7, 2024.

California Department of Conservation, California Geological Survey, 2023. CGS Note 54. Available: https://www.conservation.ca.gov/cgs/documents/publications/cgs-notes/CGS-Note-54-SoCal-Regulatory-Earthquake-Hazard-Zones-a11y.pdf. Accessed: March 7, 2024.

California Department of Conservation, California Geological Survey, 2024. Earthquake Zones of Required Investigation. Available: https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed: March 7, 2024.

California Department of Education Educational Demographics Unit Enrollment for 2022-23. Available at: https://dq.cde.ca.gov/dataquest/dqcensus/EnrAgeGrdLevels.aspx?cds=3968593&agglevel=district&year=2022-23&ro=y. Accessed April 2024.

California Department of Finance, E-5 Population and Housing Estimates for Cities, Counties, and the State, January 2021-2024, with 2020 Benchmark. May 2024. Available: https://dof.ca.gov/forecasting/demographics/estimates/e-5-population-and-housing-estimates-for-cities-counties-and-the-state-2020-2024/. Accessed: May 20, 2024.

California Department of Forestry and Fire Protection, 2008. Fire Hazard Severity Zones Maps. Available: https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones/fire-hazard-severity-zones-maps. Accessed: March 19, 2024.

California Department of Resources Recycling and Recovery (CalRecycle), 2024. RDRS Report 2: Jurisdiction Disposal and Beneficial Reuse by Destination. Available: https://www2.calrecycle.ca.gov/RecyclingDisposalReporting/Reports/JurisdictionDisposalAndBeneficial. Accessed: March 20, 2024.

California Department of Resources Recycling and Recovery (CalRecycle), SWIS Facility/Site Activity Details: Forward Landfill, Inc. (39-AA-0015). Available: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/1434?siteID=3106. Accessed: March 20, 2024.

California Department of Resources Recycling and Recovery (CalRecycle), SWIS Facility/Site Activity Details: Foothill Sanitary Landfill (39-AA-0004). Available: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/1424?siteID=3097. Accessed: March 20, 2024.

California Department of Resources Recycling and Recovery (CalRecycle), SWIS Facility/Site Activity Details: Fink Road Landfill (50-AA-0001). Available: https://www2.calrecycle.ca.gov/SolidWaste/SiteActivity/Details/992?siteID=3733. Accessed: March 20, 2024.

California Department of Resources Recycling and Recovery (CalRecycle), Jurisdiction Review Reports. Available: https://www2.calrecycle.ca.gov/LGCentral/AnnualReporting/ReviewReports. Accessed: March 20, 2024.

California Department of Resources Recycling and Recovery, 2004. SWIS Facility/Site Search. Available: https://www2.calrecycle.ca.gov/SolidWaste/Site/Search. Accessed: March 19, 2024.

California Department of Toxic Substances Control, 2024. EnviroStor Database. Available: https://www.envirostor.dtsc.ca.gov/public/map/?global_id=80001279. Accessed: March 12, 2024.

California Department of Transportation, California State Scenic Highway System Map. Available at: https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa. Accessed April 2024.

California Department of Transportation, 2024. Geotechnical Manual, Collapsable Soil. February. Available: https://dot.ca.gov/-/media/dot-media/programs/engineering/documents/geotechnical-services/202402-gm-collapsiblesoil-a11y.pdf. Accessed: March 10, 2024.

California Department of Water Resources, SGMA Basin Prioritization Dashboard. Available at: https://gis.water.ca.gov/app/bp-dashboard/final/. Accessed May 13, 2024.

California State Water Resources Control Board, 2024. GeoTracker. Available: https://geotracker.waterboards.ca.gov/map/?global_id=10181271&geotracker_ust=true#. Accessed: March 12, 2024.

California Department of Water Resources, 2024. SGMA Data Viewer. Available: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#currentconditions. Accessed: March 23, 2024.

California Energy Commission, 2023. Energy Almanac. Available: https://www.energy.ca.gov/data-reports/energy-almanac. Accessed: August 15, 2024.

California Energy Commission, 2024. California Energy Consumption Database. Available at: https://ecdms.energy.ca.gov/Default.aspx. Accessed: August 15, 2024.

Centers for Disease Control and Prevention, 2024. CDC Wonder. Available: https://wonder.cdc.gov/

City of Lathrop Department of Parks and Recreation, February 2021 Five Year Master Plan. Available at: https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/parks_and_recreation/page/6183/lathrop_master_plan_-_final_-_2.9.compressed.pdf. Accessed April 2024.

City of Lathrop, Lathrop General Plan Update Final Environmental Impact Report (SCH 2021100139), August 2022.

City of Lathrop, Municipal Services Review and Sphere of Influence Amendment, Accountability for Community Service Needs, Law Enforcement. July 2022. Available at: https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/community_development/page/25422/lathrop_msr_final_draft_july_2022_final_07.22.22.pdf. Accessed April 2024.

City of Lathrop Police Department, Lathrop Police Department Transition History. Available at: https://www.ci.lathrop.ca.us/police/page/lathrop-police-department-transition-history. Accessed April 2024.

City of Lathrop Police Department, New Lathrop Police Department June 2022 Update. Available at: https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/police/page/141/new_lathrop_police_department_update_june_2022.pdf. Accessed April 2024.

Coffman Associates, Inc., May 2016 (Amended February 2018. Airport Land Use Compatibility Plan Update for the Stockton Metropolitan Airport. Available: https://www.sjcog.org/DocumentCenter/View/1318/2016-Stockton-Metropolitan-Airport-ALUCP---Amended-February-2018?bidId=. Accessed: March 19, 2024.

De Novo Planning Group, 2022. Final Environmental Impact Report for the Lathrop General Plan Update. August.

EKI Environment & Water, Inc., 2020 Urban Water Management Plan for City of Lathrop. June 2021.

EKI Environment & Water, Inc., Memorandum RE: Hydraulic Evaluation for the Mossdale Landing West Development, City of Lathrop. February 28, 2024.

EKI Environment & Water, Inc., Water System Master Plan. December 2018.

EKI Environment & Water, Wastewater System Master Plan, City of Lathrop. December 2018.

Federal Bureau of Investigation, Crime Data Reporter, City of Lathrop, 2024. Available at: https://cde.ucr.cjis.gov/LATEST/webapp/#/pages/explorer/crime/crime-trend. Accessed April 2024.

French Camp McKinley Fire District, Our District. Available at: https://www.frenchcampfire.com/our-district. Accessed April 2024.

Intergovernmental Panel on Climate Change, 2023. Climate Change 2023 Synthesis Report. Available at: https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_FullVolume.pdf. Accessed August 15, 2024.

Lathrop Manteca Fire Protection District, 2018 General Master Plan Information and Fire Department Standards. Available at: https://www.lmfire.org/sites/default/files/fileattachments/administration/page/4411/master_plan_2018.pdf. Accessed April 2024.

Lathrop-Manteca Fire Protection District, Administration. Available at: https://www.lmfire.org/administration. Accessed April 2024.

Manteca Unified School District, School Facilities Fee Justification Report, Prepared Pursuant to Government Code Section 66001, 2022/2023, Juny 26, 2022. Available at: https://resources.finalsite.net/images/v1717710610/mantecausdnet/vxdyhrxekdduinhoduyx/SFJ_MantecaUSD_2024.pdf. Accessed May 2024.

National Aeronautics and Space Administration, 2015. Background ozone a major issue in U.S. West. Available at: https://climate.nasa.gov/news/2346/background-ozone-a-major-issue-in-us-west/. Accessed August 15, 2024.

Office of Environmental Health and Hazard Assessment, 2022. Indicators of Climate Change in California, Fourth Edition. Available at: https://oehha.ca.gov/media/downloads/climate-change/document/2022caindicatorsreport.pdf. Accessed August 15, 2024.

Pacific Gas & Electric, 2023. 2022 Power Content Label. Available at: https://www.pge.com/content/dam/pge/docs/account/billing-and-assistance/power-content-label.pdf. Accessed: August 15, 2024.

Peak & Associates, Inc. Cultural Resource Assessment for the Mossdale Landing West Project, City of Lathrop, San Joaquin County, California. March 18, 2024.

San Joaquin Council of Governments, 2022. Adopted 2022 RTP/SCS Plan. Available at: https://www.sjcog.org/608/Adopted-2022-RTPSCS-Plan.

San Joaquin County, 2023. San Joaquin County Local Hazard Mitigation Plan 2023.

San Joaquin Valley Air Pollution Control District, 2015. Guidance for Assessing and Mitigation Air Quality Impacts. Available: https://ww2.valleyair.org/media/g4nl3p0g/gamaqi.pdf. Accessed: August 15, 2024.

San Joaquin Valley Air Pollution Control District, 2024. Frequently Asked Questions. Available: https://ww2.valleyair.org/about/frequently-asked-questions/. Accessed: August 15, 2024.

Saxelby Acoustics. Environmental Noise Assessment, Mossdale West TM Lathrop, City of Lathrop, California. July 17, 2024.

TJKM. Traffic Impact Analysis Report, Mossdale West. Updated June 17, 2024.

United States Bureau of Reclamation (Knodel, Paul C.), 1992. Characteristics and Problems of Collapsible Soils. Available: https://www.usbr.gov/tsc/techreferences/rec/R9202.pdf. Accessed: March 10, 2024.

Unites States Census Bureau, Profile for Lathrop, California. Available at: https://data.census.gov/profile/Lathrop_city,_California?g=160XX00US0640704. Accessed April 2024.

United States Department of Agriculture, National Resource Conservation Service, Official Soils Series Descriptions, 2024. Available: https://soilseries.sc.egov.usda.gov/osdname.aspx. Accessed March 11, 2024.

United States Department of Agriculture, Natural Resources Conservation Service, 2024. National Soil Survey Handbook. Available: https://directives.sc.egov.usda.gov/49659.wba. Accessed: March 10, 2024.

United States Department of Agriculture, National Resource Conservation Service, 2024. Web Soil Survey. Available: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed: March 10, 2024.

United States Department of Interior, Fish and Wildlife Service. Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project. Project Code: 2024-0106187. June 19, 2024.

United States Energy Information Administration (U.S. EIA). 2020a. Analysis and Projections. Short-term Energy Outlook. Release date: September 9, 2020. Available at: https://www.eia.gov/outlooks/steo/report/global_oil.php

United States Energy Information Administration (U.S. EIA). 2020b. Table C14. Total Energy Consumption Estimates per Capita by End-Use Sector, Ranked by State, 2019. Available at:

https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_sum/html/rank_use_capita.html&sid=US

United States Energy Information Administration (U.S. EIA), 2023. Independent Statistics and Analysis. Frequently Asked Questions. Last updated September 22, 2023. Available at: https://www.eia.gov/tools/faqs/faq.php?id=33&t=6

United States Energy Information Administration (U.S. EIA). 2024. California End-Use Energy Consumption 2020, Estimates. Available at: https://www.eia.gov/beta/states/states/ca/overview

United States Energy Information Administration (U.S. EIA). 2022. California Natural Gas Marketed Production. Available at: https://www.eia.gov/dnav/ng/hist/n9050ca2M.htm

United States Environmental Protection Agency (USEPA), 2016. Commercial Buildings Energy Consumption Survey (CBECS). Available at: https://www.eia.gov/consumption/commercial/data/2012/bc/cfm/b2.php

United States Environmental Protection Agency (USEPA), 2017. Sulfur Dioxide Concentrations – EPA. Available: https://cfpub.epa.gov/roe/indicator_pdf.cfm?i=91 Accessed: August 15, 2024

United States Environmental Protection Agency (USEPA), 2024a. Health Effects of Ozone Pollution. Available: https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution. Accessed: August 15, 2024

United States Environmental Protection Agency (USEPA), 2024b. Health Effects of Ozone In the General Population. Available: https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-general-population Accessed: August 15, 2024

United States Environmental Protection Agency (USEPA), 2024d. Health and Environmental Effects of Particulate Matter (PM). Available at: https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm. Accessed: August 15, 2024

United States Environmental Protection Agency (USEPA), 2024c. Basic Information About Carbon Monoxide (CO) Outdoor Pollution. Available: https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution Accessed: August 15, 2024

United States Environmental Protection Agency (USEPA). 2024e. Basic Information About Lead Pollution. Available: https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution#how. Accessed: August 15, 2024

United States Environmental Protection Agency, 2024. TRI Toxics Tracker. Available: https://edap.epa.gov/public/extensions/TRIToxicsTracker/TRIToxicsTracker.html#continue. Accessed: March 12, 2024.

United States Environmental Protection Agency, 2024. Superfund National Priorities List (NPL) Where You Live Map. Available:

https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=33cebcdfdd1b4c3a8b51d416956c41f1. Accessed: March 19, 2024.

United States Environmental Protection Agency, 2024. RCRAINFO Search. Available: https://enviro.epa.gov/envirofacts/rcrainfo/search. Accessed: March 19, 2024.

United States Geological Survey, 2024. California's Central Valley. Available: https://ca.water.usgs.gov/projects/central-valley/about-central-valley.html. Accessed: March 7, 2024.

United States Geological Survey, 2024. What is a fault and what are the different types? Available: https://www.usgs.gov/faqs/what-a-fault-and-what-are-different-types. Accessed: March 7, 2024.

United States Geological Survey, 2024. Earthquake Magnitude, Energy Release, and Shaking Intensity. Available: https://www.usgs.gov/programs/earthquake-hazards/earthquake-magnitude-energy-release-and-shaking-intensity. Accessed: March 7, 2024.

United States Geological Survey, 2024. Lateral Spread. Available: https://www.usgs.gov/media/images/lateral-spread. Accessed: March 7, 2024.

United States Geological Survey, 2024. Land Subsidence. Available: https://www.usgs.gov/mission-areas/water-resources/science/land-subsidence#overview. Accessed: March 10, 2024.

United States Environmental Protection Agency, 2024. Search RCRA Corrective Action / Progress Track Facilities. Available: https://ordspub.epa.gov/ords/cimc/f?p=121:15:6250391337320. Accessed: March 19, 2024.

University of California, 2006. Publication 8194, Erodibility of Agricultural Soils. Available: https://anrcatalog.ucanr.edu/pdf/8194.pdf. Accessed: March 10, 2024.

West Yost, Mossdale Landing West Specific Plan Water Supply Assessment. May 2024.

This page intentionally left blank.

APPENDIX A

Initial Study, Notice of Preparation, and NOP Comments

Notice of Preparation and Initial Study

for the

Mossdale Landing West Specific Plan

March 2024

Prepared for:

City of Lathrop, Community Development Department
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7290

Prepared by:

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, CA 95762
(916) 580-9818

De Novo Planning Group

A Land Use Planning, Design, and Environmental Firm

NOTICE OF PREPARATION AND INITIAL STUDY

FOR THE

MOSSDALE LANDING WEST SPECIFIC PLAN

MARCH 2024

Prepared for:

City of Lathrop, Community Development Department
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7290

Prepared by:

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, CA 95762
(916) 580-9818

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT AND SCOPING MEETING

DATE: March 22, 2024

TO: State Clearinghouse
State Responsible Agencies
Other Public Agencies
Organizations and Interested Parties

SUBJECT: Notice of Preparation of an Environmental Impact Report and Scoping Meeting for the Mossdale Landing West Specific Plan

LEAD AGENCY: City of Lathrop
Community Development Department, Planning Division
390 Towne Centre Drive
Lathrop, CA 95330

PROJECT PLANNER: Rick Caguiat, Director of Community Development
planning@ci.lathrop.ca.us
(209) 941-7290

SCOPING MEETING: Wednesday, April, 3 at 6:00 PM

COMMENT PERIOD: March 22, 2024 to April 22, 2024

PURPOSE OF NOTICE: This is to notify public agencies and the general public that the City of Lathrop, as the Lead Agency, will prepare an Environmental Impact Report (EIR) for the Mossdale Landing West Specific Plan and to announce the Public Scoping Meeting. The City of Lathrop is interested in the input and/or comments of public agencies and the public as to the scope and content of the environmental information that is germane to the agencies' statutory responsibilities in connection with the proposed project pursuant to State CEQA Guidelines Section 15082. Responsible/trustee agencies will need to use the EIR prepared by the City of Lathrop when considering applicable permits, or other approvals for the proposed project.

COMMENT PERIOD (30 DAYS): In accordance with the time limits established by CEQA, the NOP public review period will begin on March 22, 2024 and end on April 22, 2024. Consistent with the time limits mandated by State law, your input, comments or responses must be received in writing at the address or via email listed below by 5:00 PM, on April 22, 2024:

City of Lathrop, Community Development Department
Attn: Rick Caguiat, Community Development Director
390 Towne Centre Dr. Lathrop, CA 95330
planning@ci.lathrop.ca.us

SCOPING MEETING: The City of Lathrop will conduct a public scoping meeting to solicit input and comments from public agencies and the general public on the proposed project and scope of the EIR. The scoping meeting will be held on Wednesday, April, 3 at 6:00 PM at:

City of Lathrop City Hall Council Chambers
390 Towne Centre Drive
Lathrop, CA 95330

For comments before or after the meeting or additional information, please contact Rick Caguiat, Community Development Director at 209-941-7290 or by email: planning@ci.lathrop.ca.us

PROJECT LOCATION AND SETTING: The Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site) is located within the West Lathrop Specific Plan (WLSP) area in the City of Lathrop, San Joaquin County, California (Figures 1 and 2 of the Initial Study). The site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The elevation of the site is generally flat and ranges from approximately 14 feet to 21 feet above mean sea level (MSL). The Project site is not located on a Cortese List site.

The Specific Plan Area is comprised of the following APNs (Figure 3 of the Initial Study):

- 191-190-010;
- 191-190-072;
- 191-610-020;
- 191-610-022;
- 191-620-590; and
- 191-340-030.

The majority of the Plan Area is currently undeveloped (Figure 4 of the Initial Study). There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

PROJECT DESCRIPTION: The Mossdale Landing West Specific Plan (Specific Plan or Project) would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements over five phases (Figure 5 and Figure 6 of the Initial Study). The Specific Plan provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units / acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the analysis is conservative as the number of units constructed at buildout would likely be closer to 829, as shown on the Vesting Tentative Subdivision Map. The Mossdale Landing West Specific Plan is based upon the Mossdale Village plan and policies presented in the West Lathrop Specific Plan (WLSP), which is consistent with the City of Lathrop's General Plan. The Specific Plan provides the approximate acreages of the following land uses:

- approximately 152.4 acres of Low-Density Residential;

- approximately 16.5 acres of Public designated uses that are made up of:
  - approximately 5.3 acres of linear park;
  - approximately 6.2 acres of neighborhood community park;
  - approximately 2 acres of parkland dedication south of River Islands Parkway;
  - approximately 2.5 acres of other open space (including landscaped entries); and
  - approximately 1.4 acres of levee slope easement.

There is also a remainder of 38.2 acres of undeveloped land.

For more details regarding the residential components, park, landscaping, circulation, utility improvements, objectives, and entitlements, please see the Project Description in the attached Initial Study.

PROJECT APPROVALS: The City of Lathrop is the Lead Agency for the proposed project, pursuant to the State Guidelines for Implementation of CEQA, Section 15050.

If the City Council certifies the EIR in accordance with CEQA requirements, the City may use the EIR to support the following actions:

- A General Plan Amendment to update the City of Lathrop General Plan designation from LD to LD, P, and O;
- A rezone from RL-MV and P-MV to RL-MV, P-MV, and OS-MV;
- A Specific Plan approval;
- Approval of a Code Text Amendment to the Lathrop Municipal Code;
- A Vesting Tentative Map approval;
- Williamson Act cancellation;
- Approval of development agreement between the applicant and the City;
- Improvement plan approval; and
- Project CEQA approval.

Agencies that may rely on the certified EIR to issue permits or approve certain aspects of the proposed Project includes but not limited to:

- Regional Water Quality Control Board – Construction activities would be required to be covered under the National Pollution Discharge Elimination System;
- RWQCB – The Storm Water Pollution Prevention Plan would be required to be approved prior to construction activities pursuant to the Clean Water Act;
- San Joaquin Valley Air Pollution Control District – Construction activities would be subject to the SJVAPCD codes and requirements.

AREAS OF POTENTIAL IMPACTS: The Draft EIR will examine most of the environmental areas contained in Appendix G of the State CEQA Guidelines. The topics to be addressed in the Draft EIR include: Aesthetics, Agricultural and Forestry Resources, Air Quality, Biological Resources, Cultural Resources, Energy, Geology and Soils, Greenhouse Gases and Climate Change, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Population and Housing, Public Services, Recreation, Transportation, Tribal Cultural Resources, Utilities, Cumulative Impacts, and Growth Inducing Impacts.

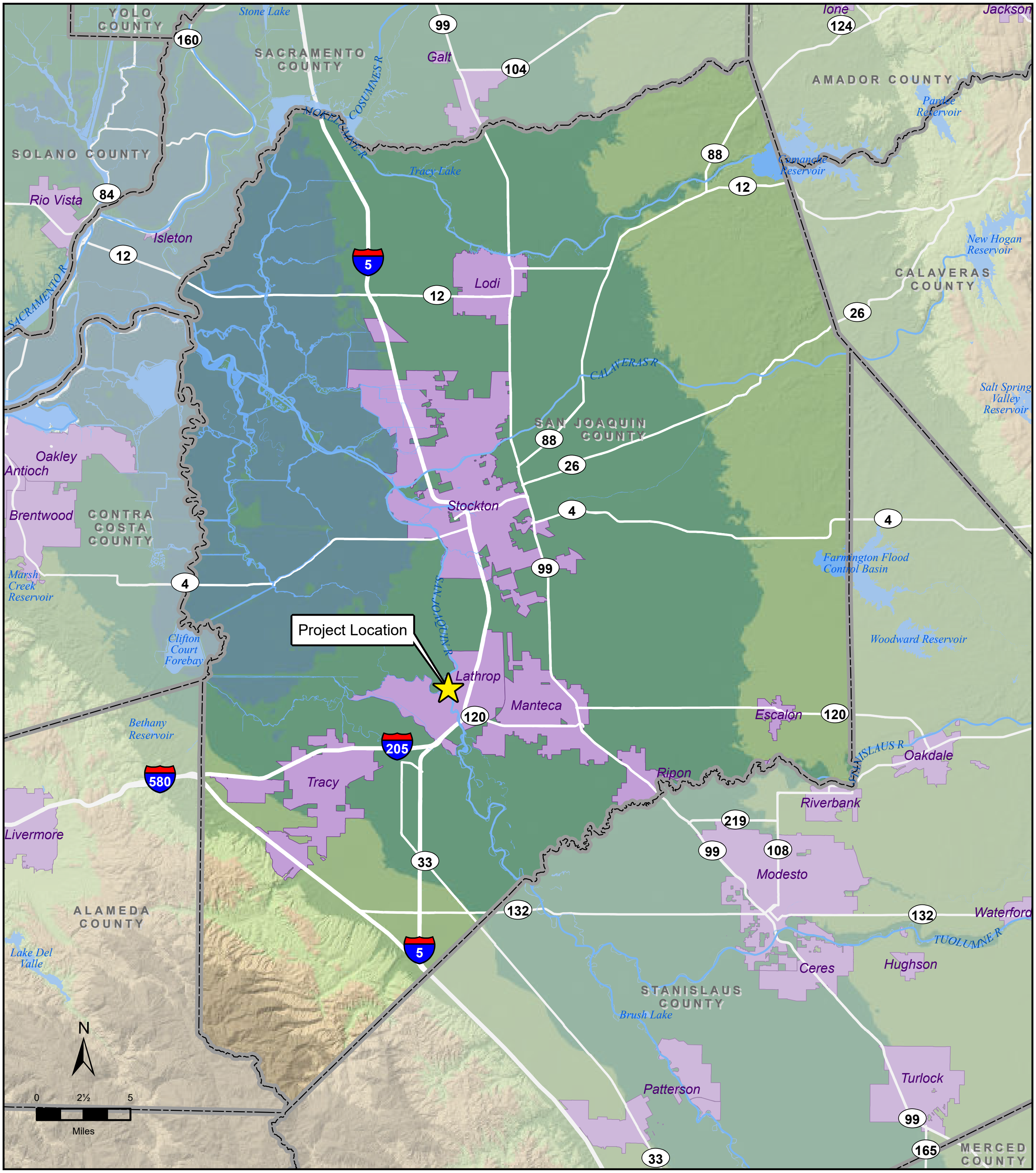
INITIAL STUDY: An Initial Study has been prepared for this project. The Initial Study identifies environmental areas/issues that would result in No Impact or a Less than Significant Impact, and environmental areas/issues that would result in a Potentially Significant Impact. All Potentially Significant Impact areas/issues will be addressed in greater detail in the Draft EIR. Areas/issues that would result in No Impact or a Less than Significant Impact, as identified in the Initial Study, will not be addressed further in the Draft EIR.

ADDITIONAL INFORMATION: A copy of the Initial Study is available on the City's website at: https://www.ci.lathrop.ca.us/com-dev/page/public-review-documents

Signature: ______________________ Date: 3/22/24

Name/Title: Rick Caguiat, Director of Community Development

Phone/Email: (209) 941-7290, planning@ci.lathrop.ca.us



LEGEND

Incorporated Area

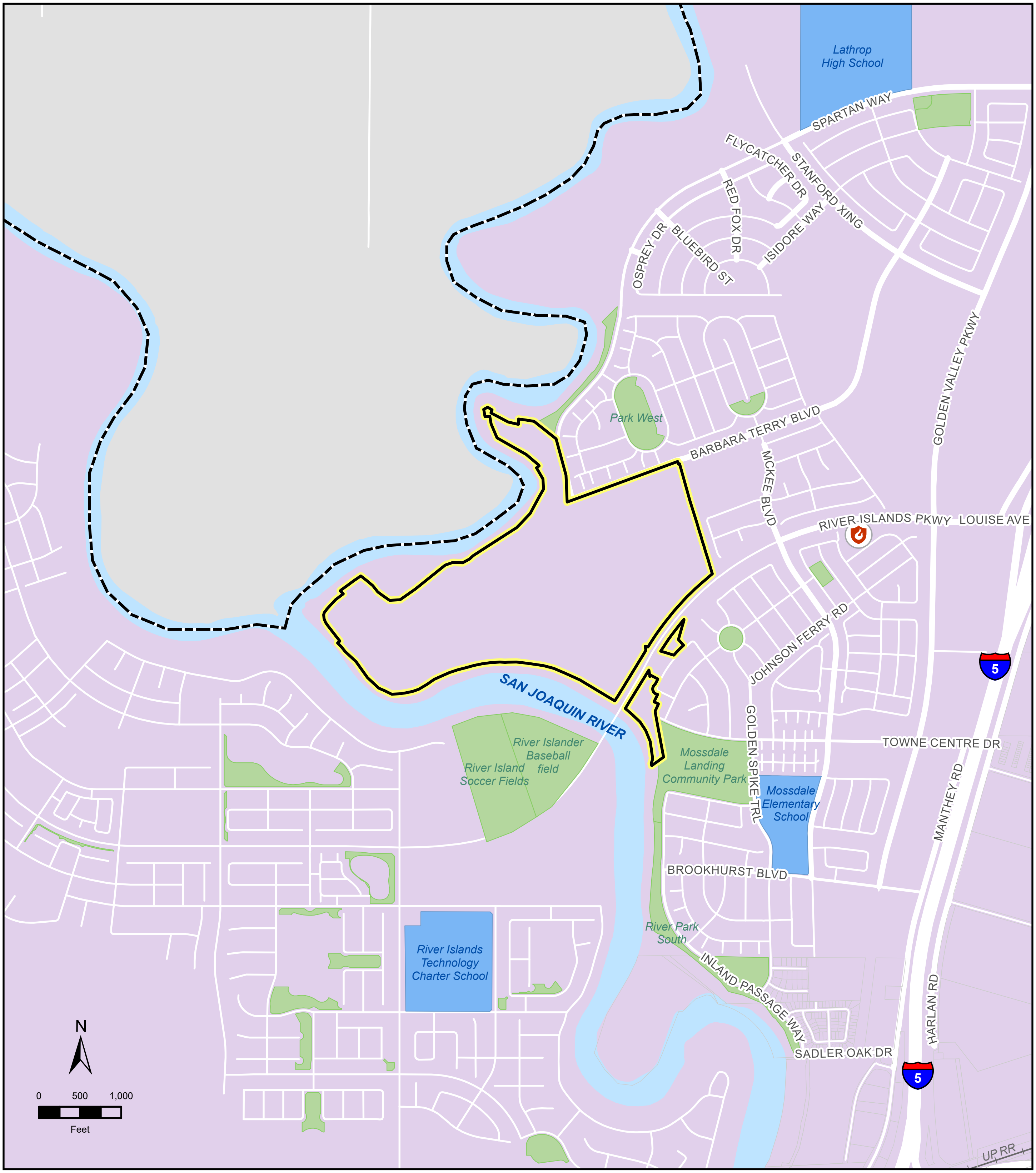
County Boundary

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 1. Regional Project Location

Sources: San Joaquin County GIS. Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



LEGEND

Project Location

Lathrop City Limits

Lathrop Fire Department - Station #34

Schools

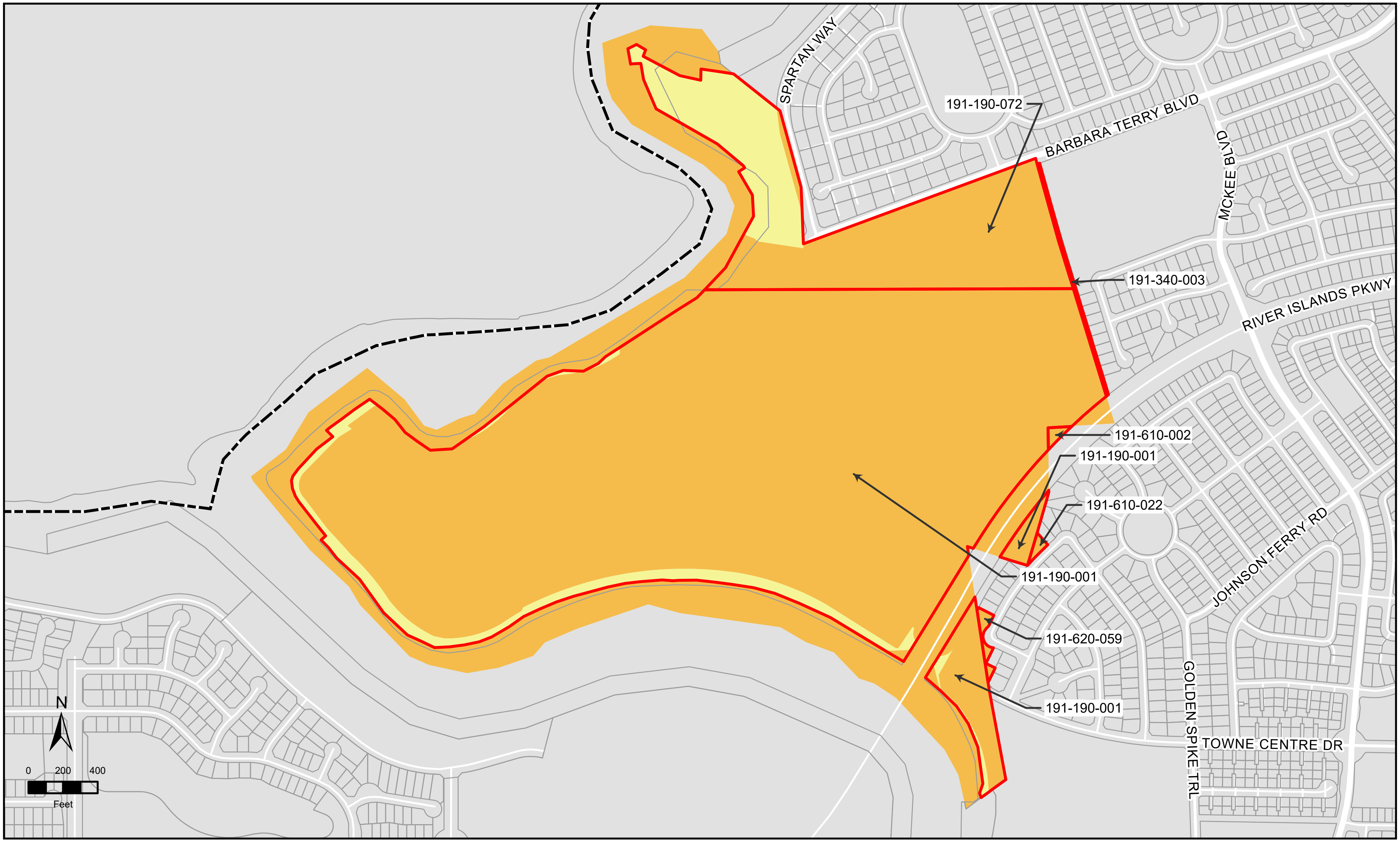
Parks

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2. Project Vicinity

Sources: San Joaquin County GIS. Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



LEGEND

Project Parcels

Surrounding Parcels

Tracy City Limits

Property Ownership

Reclamation District #17

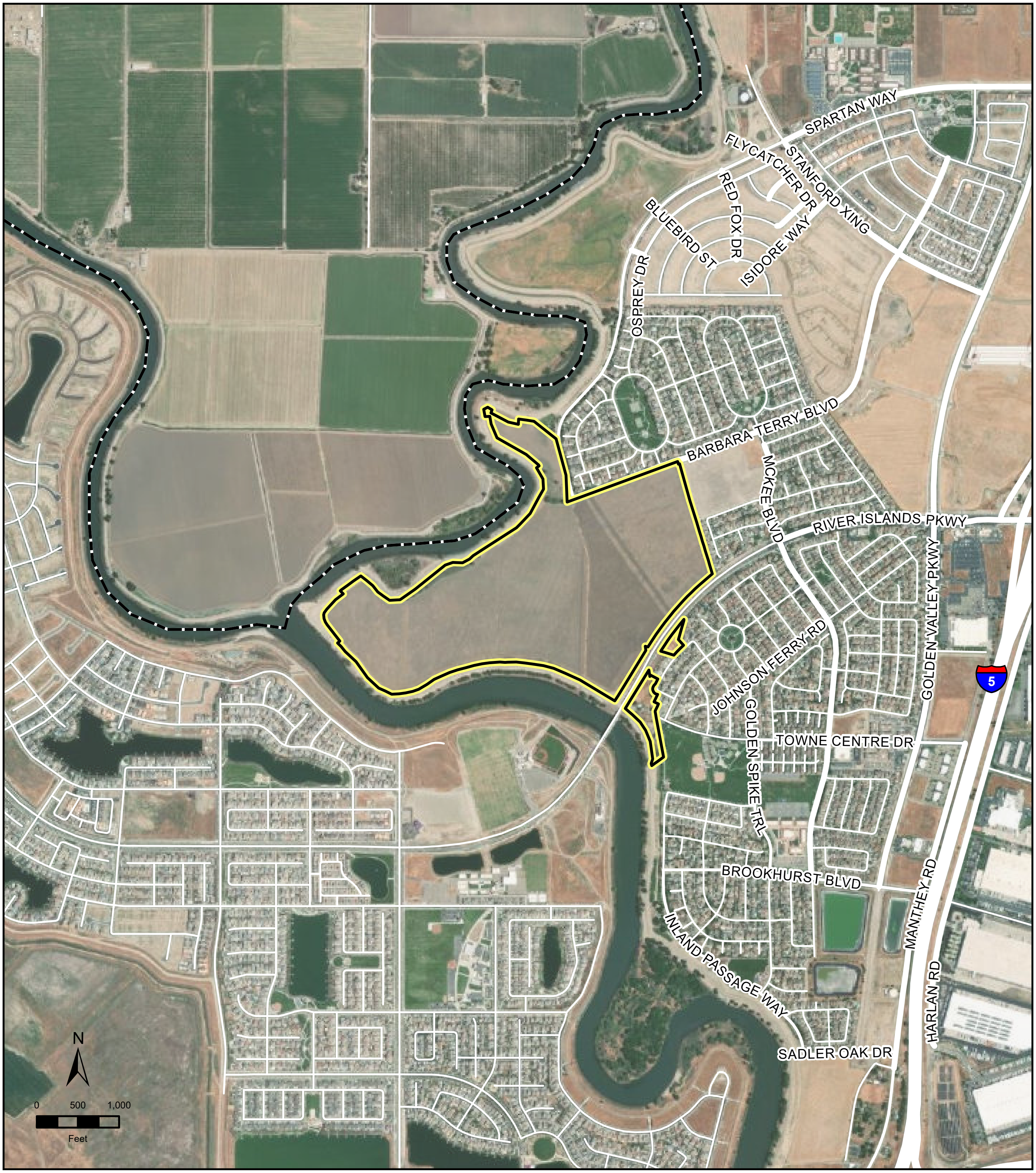
WSBG Investment LP

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 3. APN and Property Ownership

Sources: O'Dell Engineering; San Joaquin County GIS. Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



LEGEND

Project Location

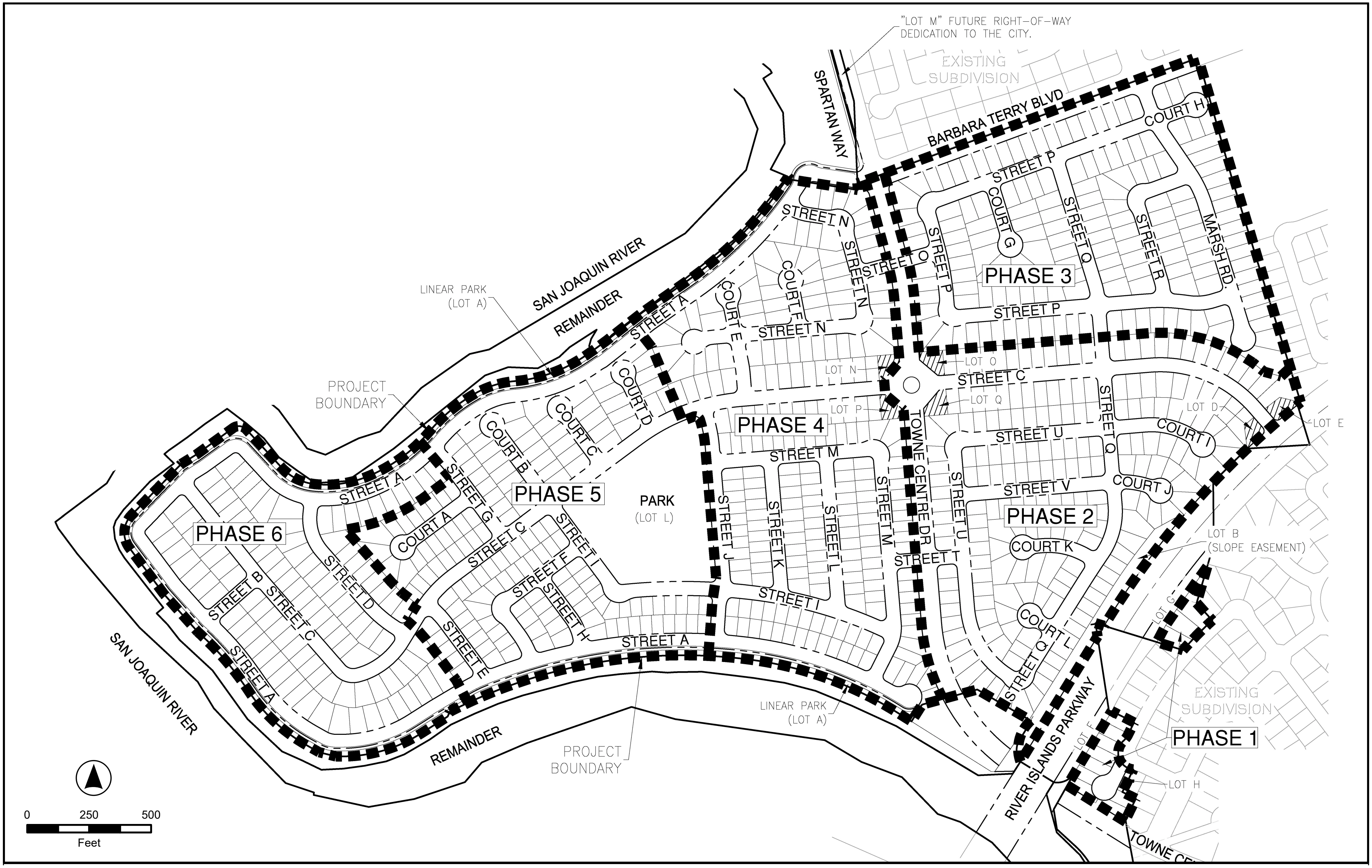
Lathrop City Limits

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 4. Aerial View of Project Site

Sources: San Joaquin County GIS, ArcGIS Online World Imagery Map Service(10/26/2022).
Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



Legend

Phase

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 5. Phasing Map

Source: O'Dell Engineering, 10/13/2023.

Legend

- 42'x80' and 42'x85' Lots
- 45'x75' Lots
- 50'x80' Lots
- 50'x100' Lots
- Open Space

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 6. Project Site Map

Source: Mossdale West Urban Design Concept, City of Lathrop/O'Dell Engineering, 3/11/2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

TABLE OF CONTENTS

This page left intentionally blank.

INITIAL STUDY CHECKLIST

PROJECT TITLE

Mossdale Landing West Specific Plan

LEAD AGENCY NAME AND ADDRESS

City of Lathrop
Community Development Department, Planning Division
390 Towne Centre Drive
Lathrop, CA 95330

CONTACT PERSON AND PHONE NUMBER

Rick Caguiat, Director of Community Development
Community Development Department, Planning Division
390 Towne Centre Drive
Lathrop, CA 95330
planning@ci.lathrop.ca.us
(209) 941-7290

PROJECT SPONSOR'S NAME AND ADDRESS

WSBG Investments, LP
2217 Coffee Road
Modesto, CA 95355

PROJECT LOCATION AND SETTING

The Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site) is located within the West Lathrop Specific Plan (WLSP) area in the City of Lathrop, San Joaquin County, California (Figures 1 and 2). The site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The elevation of the site is generally flat and ranges from approximately 14 feet to 21 feet above mean sea level (MSL).

The Specific Plan Area is comprised of the following APNs (Figure 3):

- 191-190-010;
- 191-190-072;
- 191-610-020;
- 191-610-022;
- 191-620-590; and
- 191-340-030.

The majority of the Plan Area is currently undeveloped (Figure 4). There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

PROJECT DESCRIPTION

The Mossdale Landing West Specific Plan (Specific Plan or Project) would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements over five phases (Figure 5 and Figure 6). The Mossdale Landing West Specific Plan is based upon the Mossdale Village plan and policies presented in the West Lathrop Specific Plan (WLSP), which is consistent with the City of Lathrop's General Plan. The Specific Plan provides the approximate acreages of the following land uses:

- approximately 152.4 acres of Low-Density Residential;
- approximately 16.5 acres of Public designated uses that are made up of:
    - approximately 5.3 acres of linear park;
    - approximately 6.2 acres of neighborhood community park;
    - approximately 2 acres of parkland dedication south of River Islands Parkway;
    - approximately 2.5 acres of other open space (including landscaped entries); and
    - approximately 1.4 acres of levee slope easement.

There is also a remainder of 38.2 acres of undeveloped land.

RESIDENTIAL

The Specific Plan provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units / acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the analysis is conservative as the number of units constructed at buildout would likely be closer to 829, as shown on the Vesting Tentative Subdivision Map.

The Specific Plan will provide a singular housing type: low-density, single-family, detached housing units, governed by the development standards under Low Density in the WLSP. WLSP defines Low Density as 3 to 9 dwelling units per net acre with maximum coverage of 50 percent. For the proposed residential uses, four lot sizes are proposed ranging from 3,360 square feet to 5,000 square feet with two different lot frontage widths and three different lot lengths. The following lot dimensions would be provided: 42 feet by 80 feet, 42 feet by 85 feet, 50 feet by 80 feet, and 50 feet by 100 feet.

PARKS AND LANDSCAPING

The Specific Plan will feature two park areas: a 6.2-acre park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park around the perimeter where the site is adjacent to the San Joaquin River. In addition, each major road right-of-way will include street trees, which will be a mixture of evergreen and deciduous varieties best suited to the climate, spaced 30-40 feet on center. Every residential lot will have a minimum of one street tree. The park spaces will include street trees, accent trees, low water use shrubs and turf. There is also a two-acre parkland dedication south of Towne Center Drive that may or may not be developed as a part of the proposed Project.

Irrigation for the landscaping will be provided as follows:

- Root watering systems for the trees;
- Rotor/rotary for turf; and
- Point source for shrubs.

The Specific Plan includes landscape architectures standards. Landscaping would be provided throughout the Plan Area, such as along roadways, paths, and parks. Tree species with invasive characteristics would be avoided. When selecting plant species, species that would minimize maintenance challenges would be preferred. Evergreen shrubs would be utilized where appropriate for screening of fences or utility structures. A mix of deciduous and evergreen tree varieties would be utilized to create interest throughout the seasons. Traditional "lawn" species would be highly discouraged in parkway strips and should be limited to parks and public open spaces for recreational use. Further, deep rooting species that use less water would be utilized when "lawn" species are used.

CIRCULATION

The Specific Plan will include a network of arterial streets, collector streets, and local streets (Figure 7). The local roads will be designed according to City of Lathrop standards with a 56-foot right-of-way. The one exception would Towne Center Drive, which will have a City standard 80-foot right-of-way width. Existing Towne Centre Drive south of River Islands Parkway will be extended under River Islands Parkway and continue north through the Mossdale West site to Barbara Terry Boulevard. Full frontage improvements will be added to the extension south of River Islands Parkway. Additionally, the scope of the Project includes widening the existing River Islands Parkway and Barbara Terry Boulevard with full frontage improvements where they are adjacent to the site to the ultimate right-of-way widths of 156 feet and 45 feet to 52 feet respectively.

The Specific Plan will include bicycle, pedestrian, and transit facilities (Figures 7 and 8). Pedestrian walkways would be provided along all local streets. Class II bike lanes will be provided along the proposed arterial and collector streets. A multi-use trail with a Class I bike path would be provided along the San Joaquin River. Additionally, two bus stops are proposed along Town Centre Drive.

UTILITIES

Sanitary sewer, water and storm drain systems will be built in the rights-of-way of the proposed streets and will connect to nearby existing systems (Figure 9).

The proposed Project would connect to existing City infrastructure to provide water, sewer, and storm drainage utilities. Existing storm drain, sewer, water, and gas lines/pipes are currently located within the roadways of the adjacent residential uses to the north and west.

The Project would be served by the following existing service providers:

1. City of Lathrop for water;
2. City of Lathrop for wastewater collection and treatment;
3. City of Lathrop for stormwater collection; and
4. Pacific Gas and Electric Company for gas and electricity.

Utility extensions would be installed to provide services to the Project. Utility lines within the Project site and adjacent roadways would be extended throughout the Project site. Wastewater, water, and storm drainage lines would be connected via existing lines along the various residential roadways adjacent north and west of the site.

The water system for Mossdale Landing West will be designed and constructed according to the City's 2019 Water System Master Plan.

The wastewater system for Mossdale Landing West will be designed and constructed according to the City's 2019 Wastewater System Master Plan. Wastewater from the Mossdale Landing West site will be directed via a gravity system to the existing Mossdale Pump Station, located near the northwest corner of the intersection of River Islands Parkway and McKee Boulevard. From there, it will travel via force main to be treated at the City-owned Lathrop Consolidated Treatment Facility, which is located on S Howland Road, northeast of the Interstate 5/120 Interchange. Upgrades may be required to the pump station and the downstream system to accommodate wastewater from the Mossdale Landing West site.

According to the Mossdale Landing Master Drainage Plan, the Mossdale Village drainage shed is divided into six sub-sheds with a combined area of 912 acres. Each sub-shed functions independently and has its own pump station, storm water quality basin or vault and flood control detention basin. Underground detention solutions are permitted to be used where appropriate. Each sub-shed is required to treat the first flush storm event, which is the volume of water equal to the 85th percentile of a 24-hour storm event. The pumps will begin to discharge water to a single outfall at the San Joaquin River (up to 30 percent of the peak discharge rate) once the first flush event has been treated. After the rain event is over, the pumps will continue to direct water to the river; however, if the San Joaquin River rises to a base flood level of 21.0 feet, the pumps will shut off until the water level in the river subsides. More information can be obtained from the Drainage Plan.

The storm drain lines in each individual residential street in Mossdale Landing West will drain towards the main line in Towne Centre Drive, which crosses River Islands Parkway and connects to an existing main near the intersection of Village Avenue. Water will then travel via gravity to the existing pump station located in the southwest corner of the Mossdale Landing Community Park, which will eventually pump the water into the San Joaquin River. Upgrades to the existing pump and storm drain system will be determined.

If an interim storm drain solution is required, a temporary detention basin can constructed near the southern border of the site to hold water until it can be slowly released to enter the existing storm drain system.

In order to meet the requirements of the NPDES General Permit for Stormwater Discharges from Small MS4s, the City has prepared a Stormwater Management Plan and adopted the 2015 Multi-Agency Post-Construction Stormwater Standards Manual. Because it is likely to undergo elevated population growth, the City must also adhere to the supplemental provisions of Attachment 4 of the General Permit, which contains design standards and receiving water restrictions that must be incorporated into the design and installation of infrastructure associated with new development. According to the General Permit, both structural and non-structural Best Management Practices (BMPs) for post-construction must be installed for any new development. Structural BMPs capture and treat the first flush runoff. Examples include grassy swales, stormwater quality basins and underground vaults. To help guarantee the proper continuing operation and maintenance of these BMPs, operations and maintenance (O&M) manuals and recommended maintenance schedules are required. Examples of non-structural BMPs include good housekeeping and employee training.

SPECIFIC PLAN

Before establishing a planned development or issuing development or building permits, the WLSP states that a Specific Plan document must be approved and adopted by the City Council. The Specific Plan provides a framework of development and Project implementation for use by the City, developers and builders, which includes street and design standards and guidelines, detailed land uses, infrastructure, site planning, architecture, landscape. The approval of the proposed Specific Plan document satisfies the requirements of the City's Specific Plan process.

VESTING TENTATIVE MAP

Also referred to as a Tentative Subdivision Map, a Vesting Tentative Map will be submitted to initiate the process of subdividing the Project site. The Vesting Tentative Map design will be governed by the Subdivision Map Act, the City of Lathrop Subdivision Ordinance, the WLSP, the Specific Plan, and the City's infrastructure master plans. The Vesting Tentative Map will be subject to review by the City's Planning Commission and approval by the Lathrop City Council.

ARCHITECTURAL DESIGN REVIEW

Architectural Design Review is a discretionary permit and will be required at the Final Map stage. The purpose of the Architectural Design Review is to confirm that the proposed plans for the Project are consistent with the policies and guidelines set forth in the WLSP and the proposed Mossdale Landing West Specific Plan. The City requires projects to meet specific standards with respect to architectural styles and signage, landscape and design themes. The Architecture Design Review discretionary permit is subject to review and approval by the City's Community Development Director.

WILLIAMSON ACT CANCELLATION

The entire Plan Area falls under the Williamson Act and will require existing contracts to go through the process of cancellation and non-renewal. The Williamson Act cancellation process cannot occur until after the properties are annexed to the City of Lathrop.

Cancellation of the Williamson Act is provided in Sections 51240-51287 of the Government Code. The state law requires those who wish for non-renewal, to file a Notice of Non-Renewal signifying intent to not renew the contract and file a petition for cancellation with the Lathrop City Council. The Lathrop City Council must find that the cancellation is consistent with the purposes of the Williamson Act and furthers public interest to approve the cancellation. Once approved, the land may continue to be used for agricultural purposes up until the development of land requires discontinuation.

PROJECT OBJECTIVES

The Specific Plan has been designed to meet the following Project objectives:

- Complete neighborhoods which foster a mixture of compatibly scaled housing types on urban lots.
- A residential development that will incorporate traditional elements found throughout Central Valley communities including a hierarchy of interconnected streets, the incorporation of assorted architectural styles, tree lined thoroughfares, an emphasis upon pedestrian scale and access with a nod to the agricultural traditions of the Valley.
- Street patterns which are carefully configured to allow for multiple outlets from neighborhoods, and to provide for connections between neighborhoods, without encouraging through traffic to create convenience and access without a private automobile.
- A network of planned walkways and bikeways which make getting outside convenient, easy and enjoyable.
- Durable construction materials and designs suited to local conditions to contribute to the ongoing costs of the housing will be encouraged.
- Provide a range of housing opportunities to support a diverse population, lifestyles, and family groups.
- Establish a planning/zoning concept that is responsive to the market.

- Implement the Phasing Plan for logical development in line with the West Lathrop Specific Plan.
- Implement City's Infrastructure Master Plans.

GENERAL PLAN AND ZONING

The Plan Area is designated as Low Density Residential (LD) by the City's General Plan Land Use Map (Figure 10) and is zoned as RL-MV (Low Density Residential) and P-MV (Public Schools Parks Open Space) by the City's Zoning Map (Figure 11).

GENERAL PLAN AMENDMENT

The proposed Project will include a General Plan Amendment from LD to LD, Park (P), and Open Space (O).

REZONE

The proposed Project will include a rezone from RL-MV and P-MV to RL-MV, P-MV (Park), and OS-MV (Open Space).

REQUESTED ENTITLEMENTS AND OTHER APPROVALS

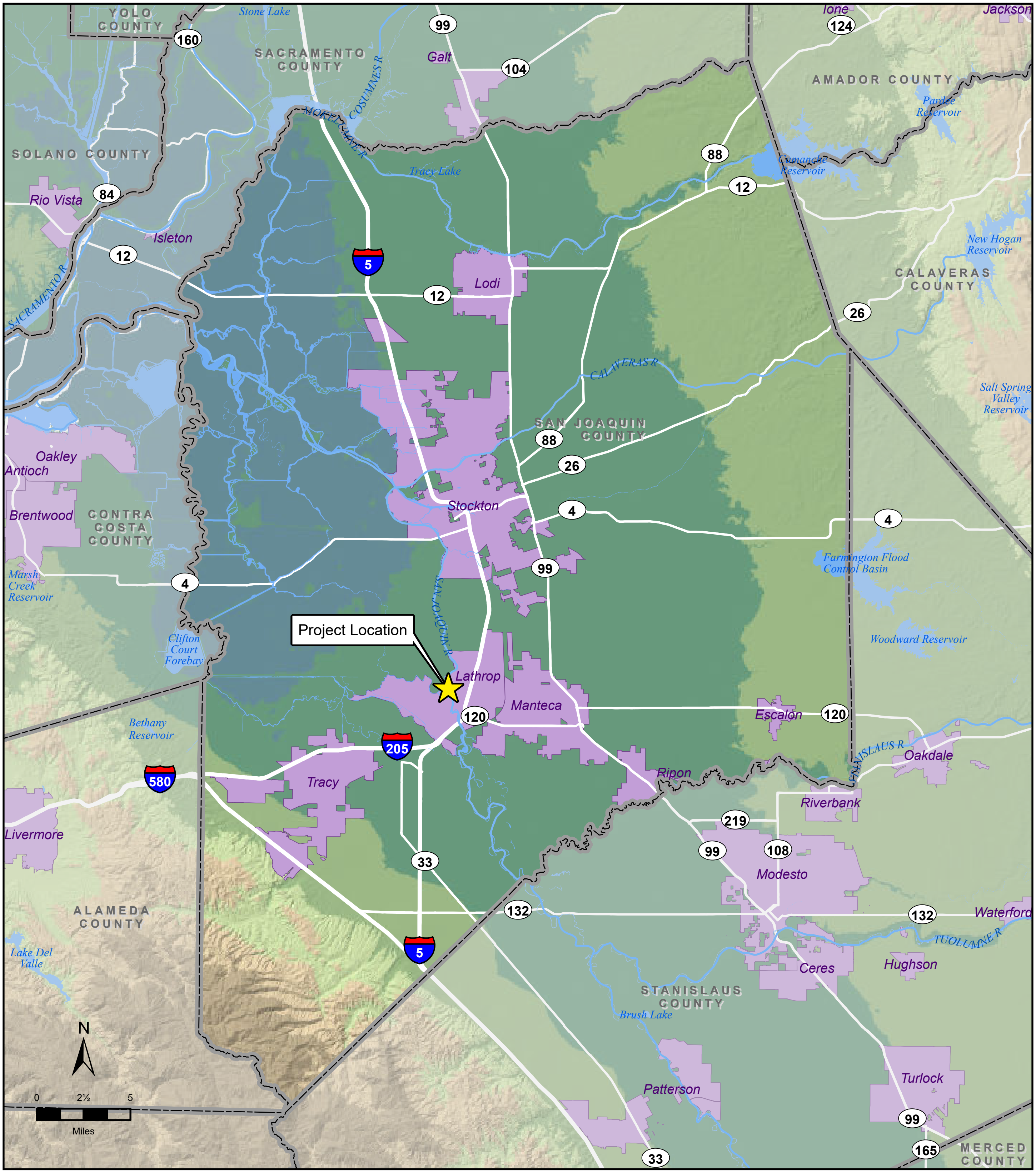
The City of Lathrop is the Lead Agency for the proposed Project, pursuant to the State Guidelines for Implementation of CEQA, Section 15050.

If the City Council certifies the EIR in accordance with CEQA requirements, the City may use the EIR to support the following actions:

- A General Plan Amendment to update the City of Lathrop General Plan designation from LD to LD, P, and O;
- A rezone from RL-MV and P-MV to RL-MV, P-MV, and OS-MV;
- A Specific Plan approval;
- Approval of a Code Text Amendment to the Lathrop Municipal Code;
- A Vesting Tentative Map approval;
- Williamson Act cancellation;
- Approval of development agreement between the applicant and the City;
- Improvement plan approval; and
- Project CEQA approval.

The following agencies may rely on the certified EIR to issue permits or approve certain aspects of the proposed Project:

- Regional Water Quality Control Board (RWQCB) – Construction activities would be required to be covered under the National Pollution Discharge Elimination System (NPDES);
- RWQCB – The Storm Water Pollution Prevention Plan (SWPPP) would be required to be approved prior to construction activities pursuant to the Clean Water Act;
- San Joaquin Valley Air Pollution Control District (SJVAPCD) – Construction activities would be subject to the SJVAPCD codes and requirements.



LEGEND

Incorporated Area

County Boundary

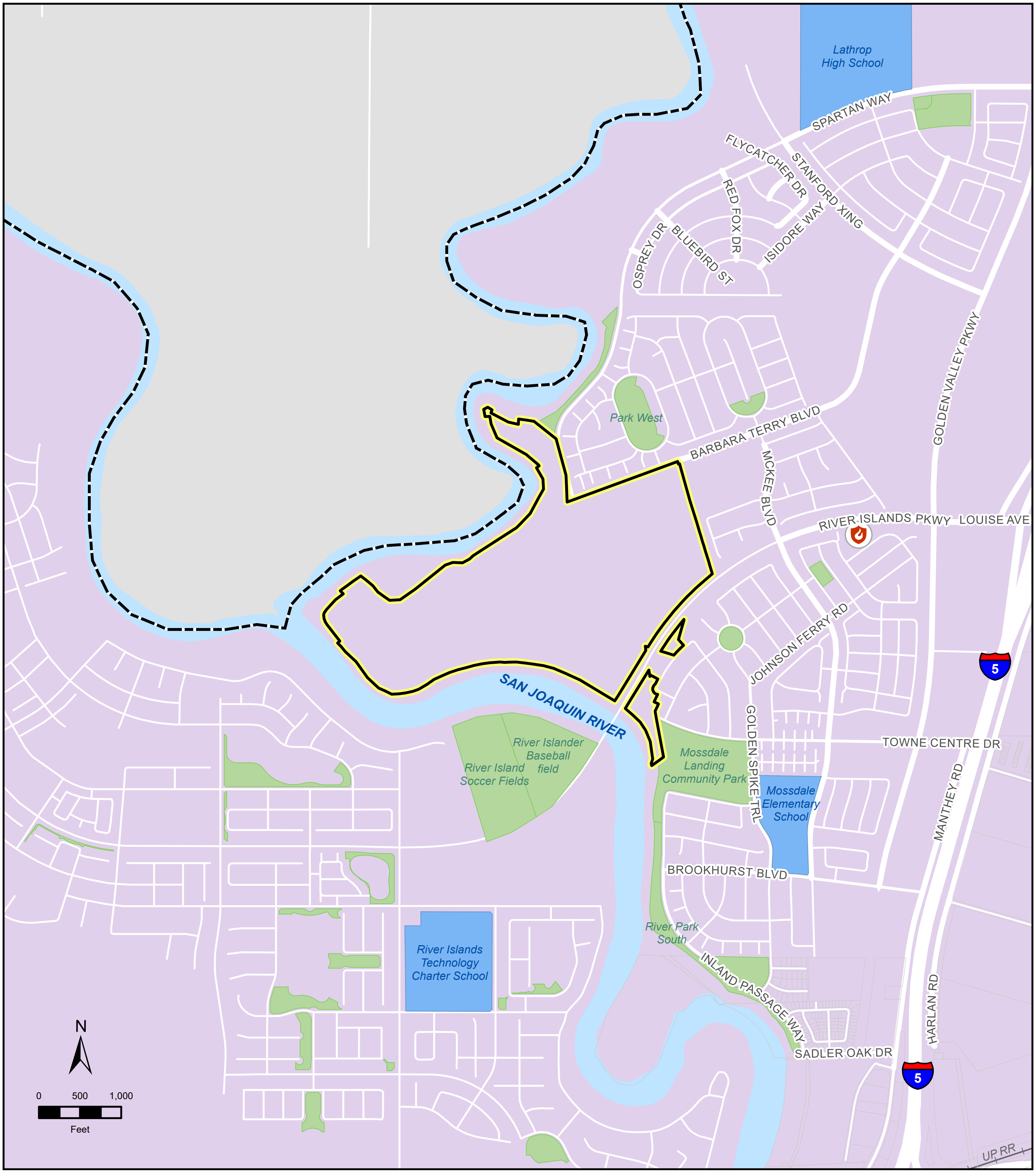
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 1. Regional Project Location

Sources: San Joaquin County GIS. Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



LEGEND

Project Location

Lathrop City Limits

Lathrop Fire Department - Station #34

Schools

Parks

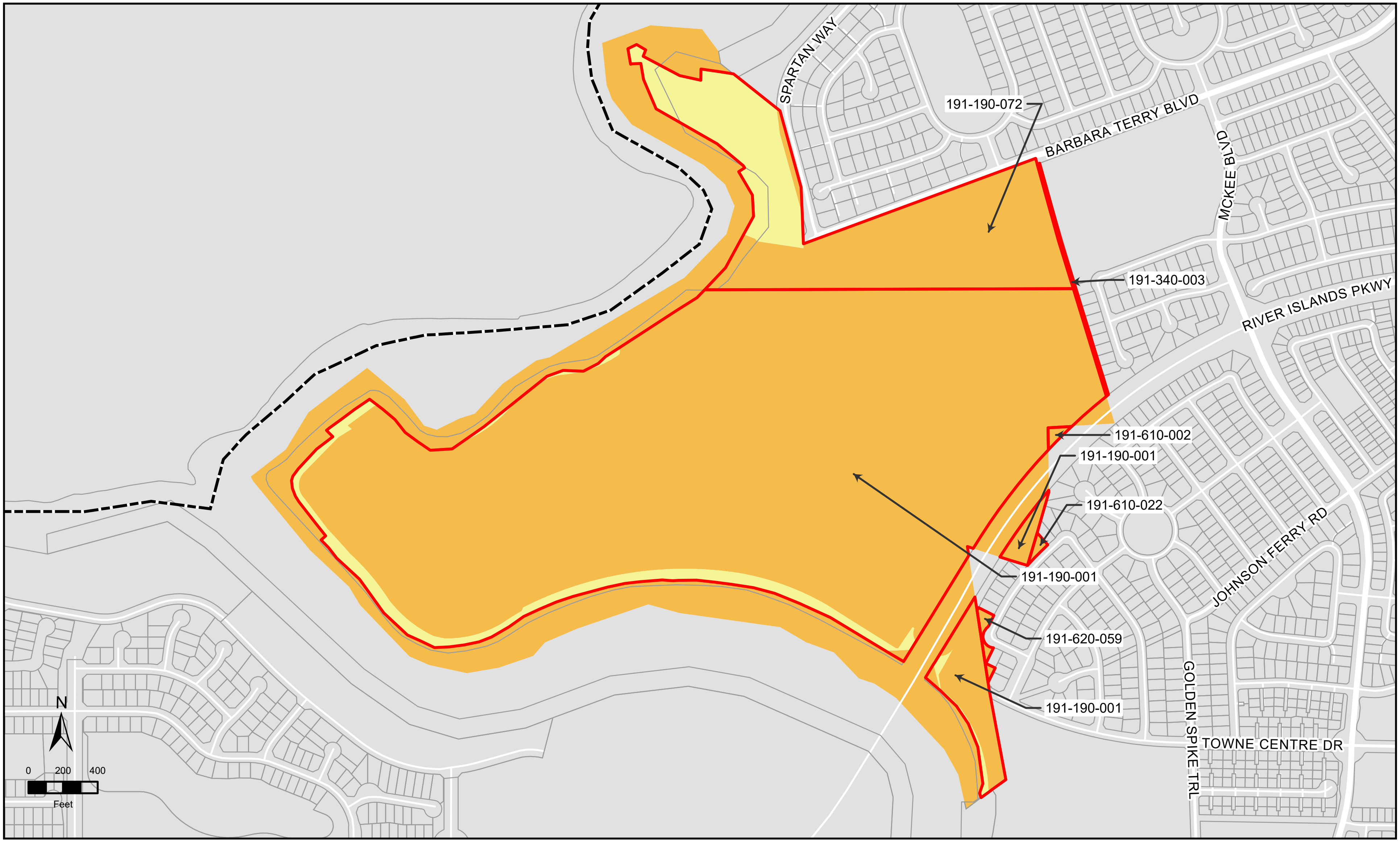
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2. Project Vicinity

Sources: San Joaquin County GIS. Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



LEGEND

Project Parcels

Surrounding Parcels

Tracy City Limits

Property Ownership

Reclamation District #17

WSBG Investment LP

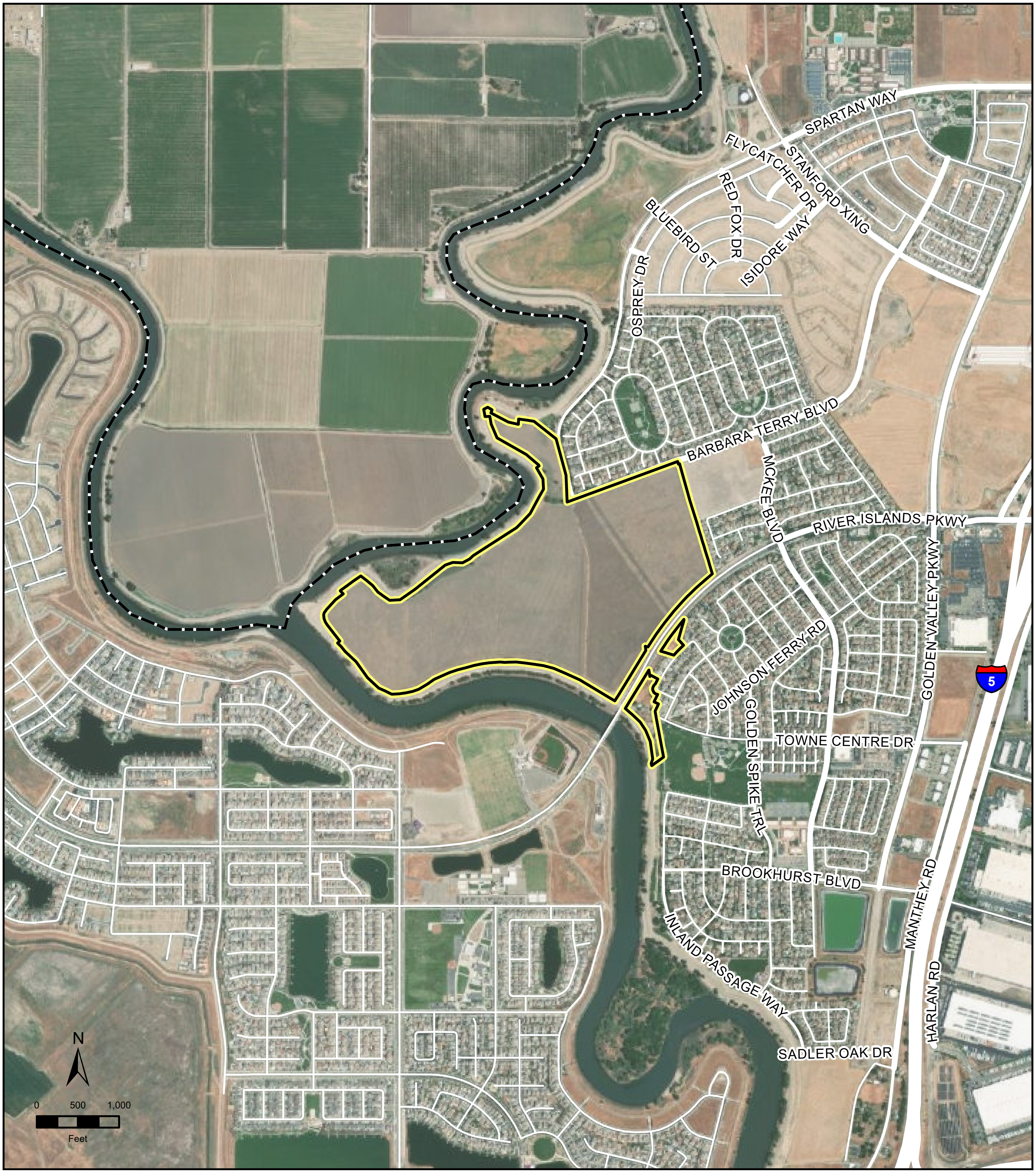
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 3. APN and Property Ownership

Sources: O'Dell Engineering; San Joaquin County GIS. Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



LEGEND

Project Location

Lathrop City Limits

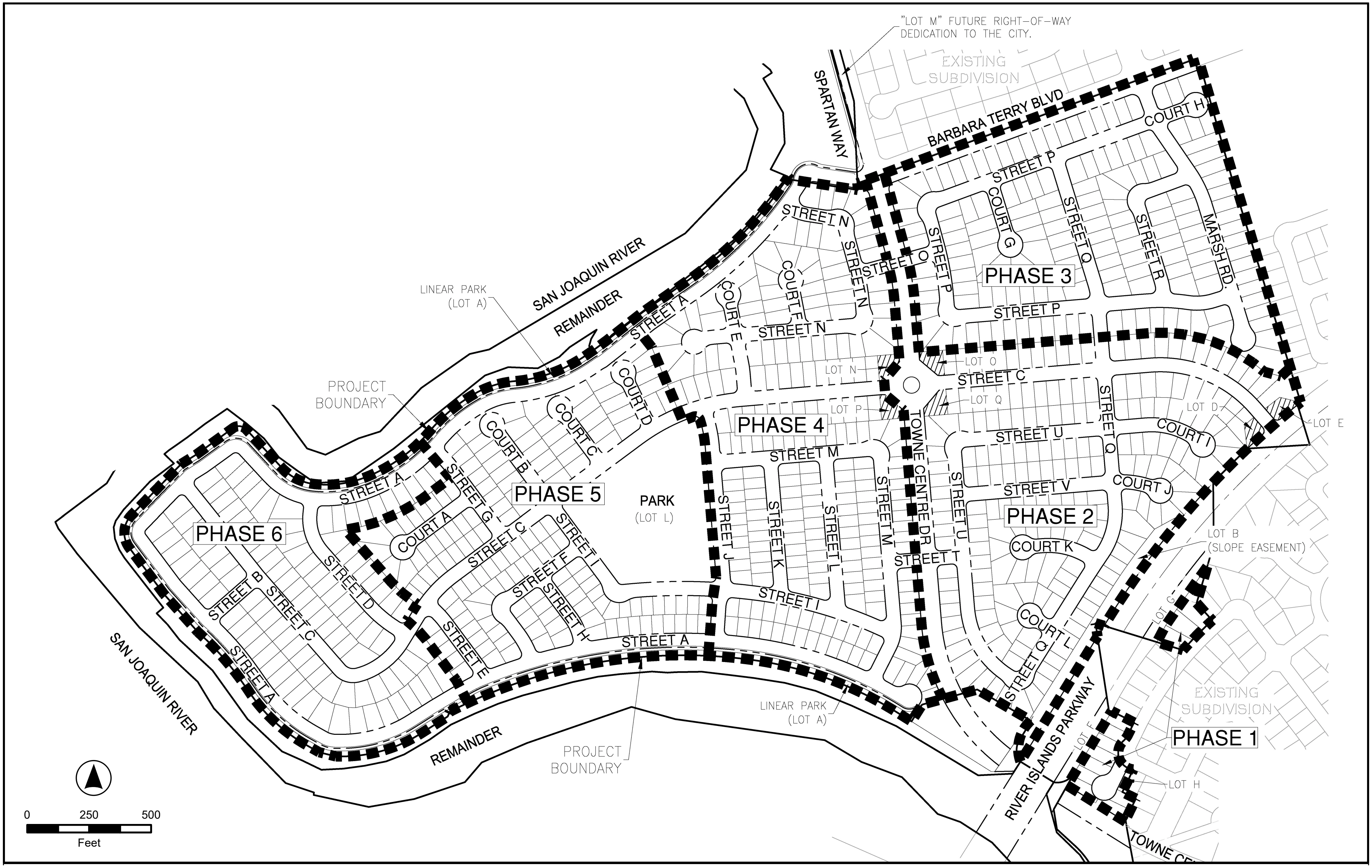
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 4. Aerial View of Project Site

Sources: San Joaquin County GIS, ArcGIS Online World Imagery Map Service(10/26/2022).
Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



Legend

Phase

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 5. Phasing Map

Source: O'Dell Engineering, 10/13/2023.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

Legend

42'x80' and 42'x85' Lots	50'x100' Lots
45'x75' Lots	Open Space
50'x80' Lots	

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 6. Project Site Map

Source: Mossdale West Urban Design Concept, City of Lathrop/O'Dell Engineering, 3/11/2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

Legend

Arterial

Collector

Local Street

Proposed Bus Stop

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 7. Circulation Map

Source: Mossdale West Urban Design Concept, City of Lathrop/O'Dell Engineering, 3/11/2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

Legend

Pedstrian Walkway

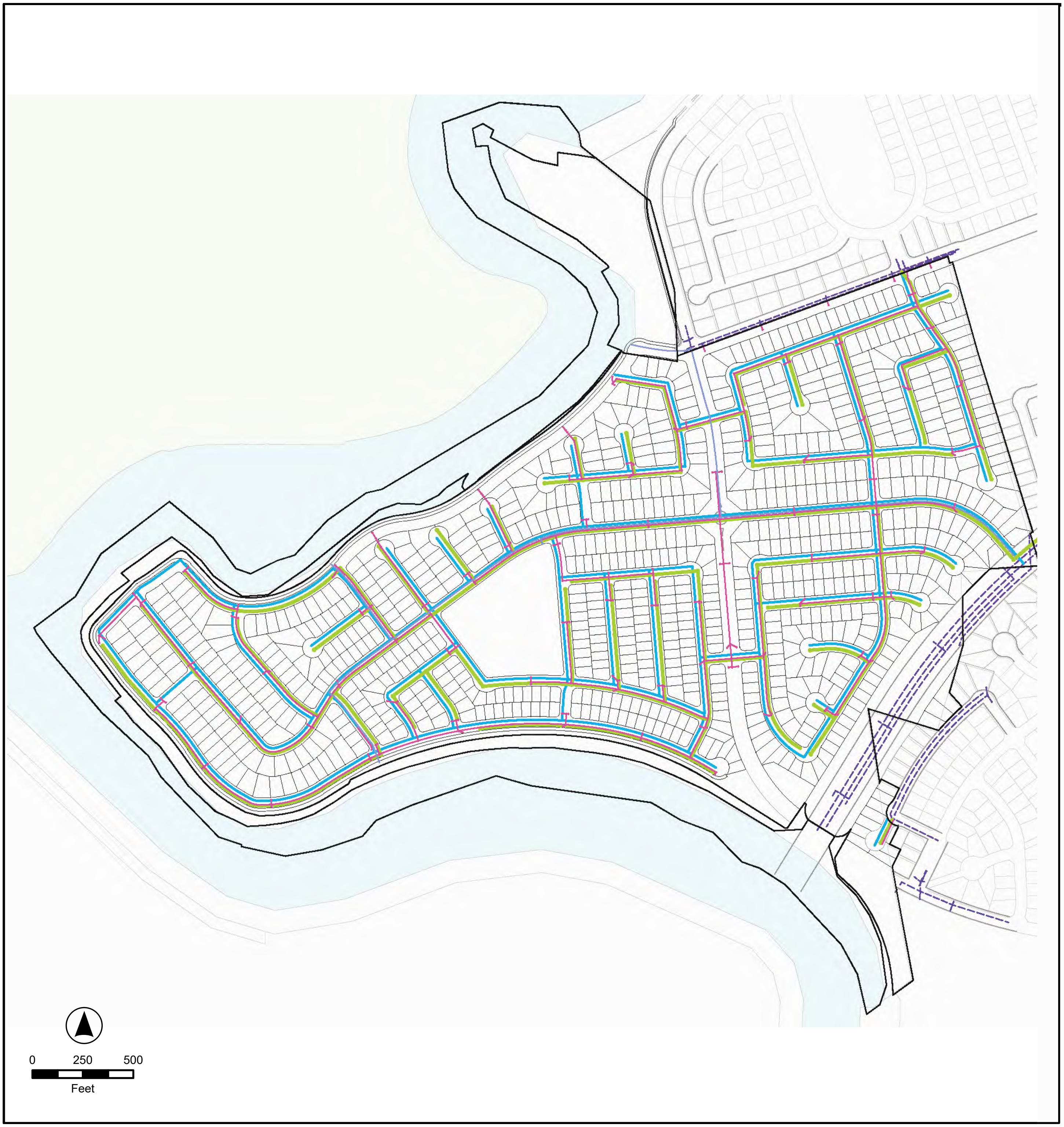
Multi-use Trail with Class I Bike Path

Class II Bike Lane

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 8. Bicycle and Pedestrian Map

This page left intentionally blank.



Legend

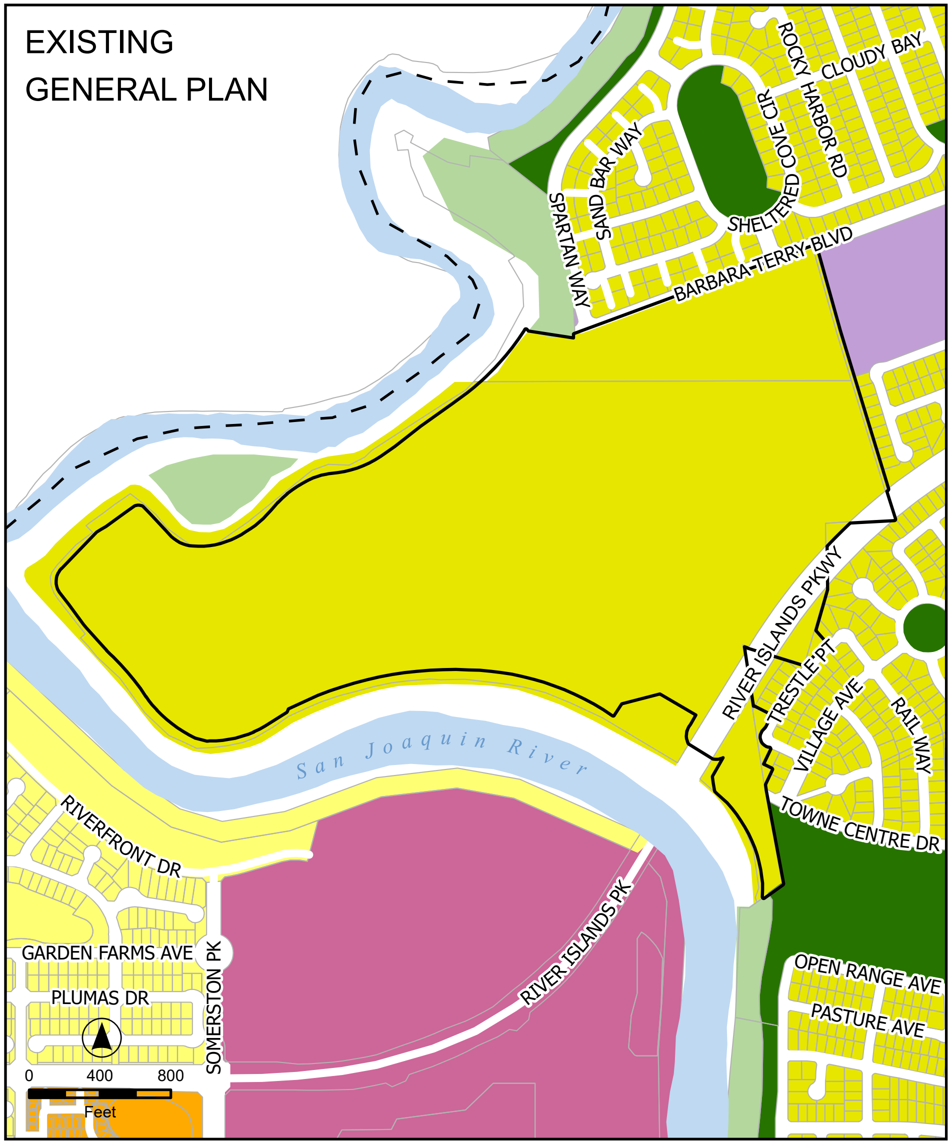
- Storm Drain
- Water Main
- Sanitary Sewer
- Existing Utilities

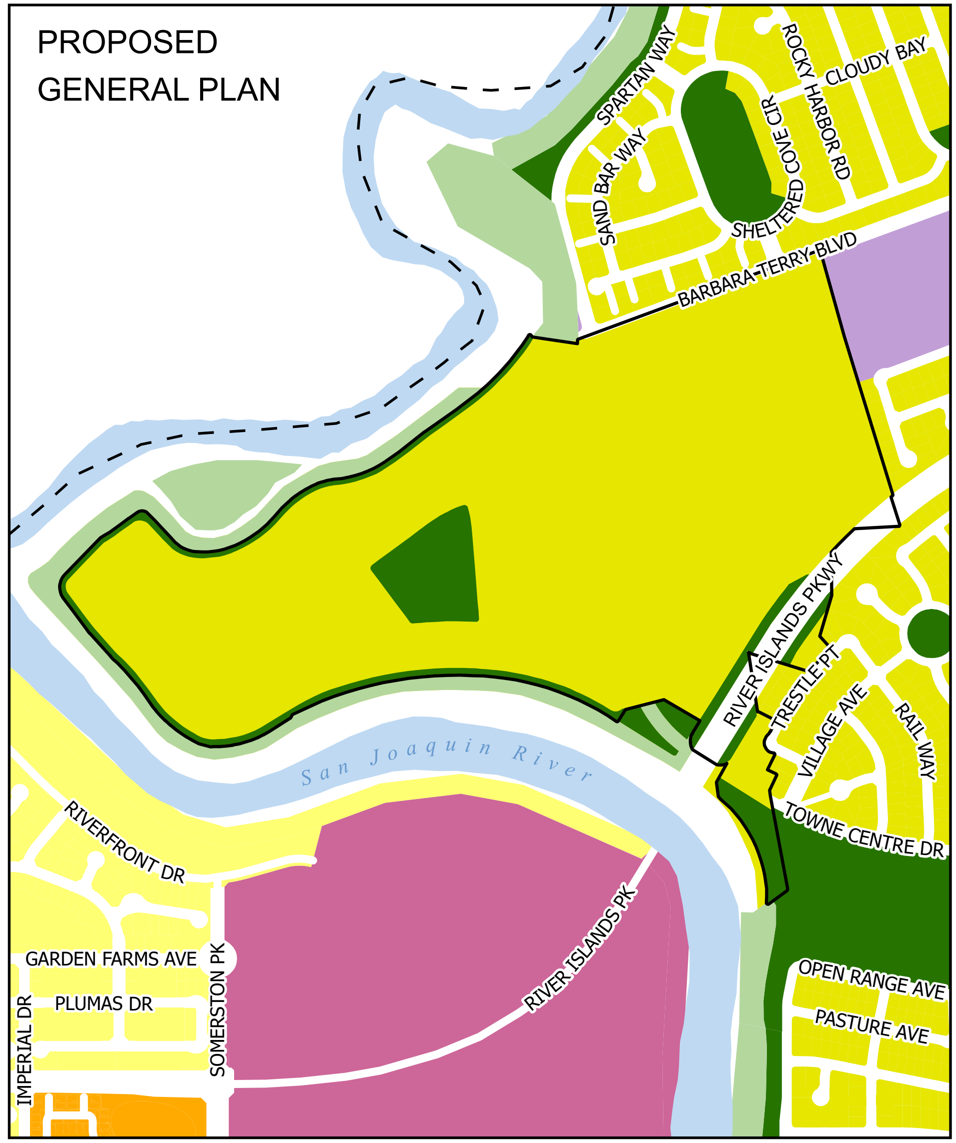
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 9. Utilities Map

Source: Mossdale West Urban Design Concept, City of Lathrop/O'Dell Engineering. Map date: March 20, 2024.

This page left intentionally blank.





Legend

- Project Boundary
- Lathrop City Boundary
- LD: Low Density Residential (1-7 du/A)
- P/QP: Public/Quasi-Public
- P: Park
- OS: Open Space
- RL-RI: Residential Low (3-9 du/A)
- RM-RI: Residential Medium (6-20 du/A)
- MU-RI: Mixed Use

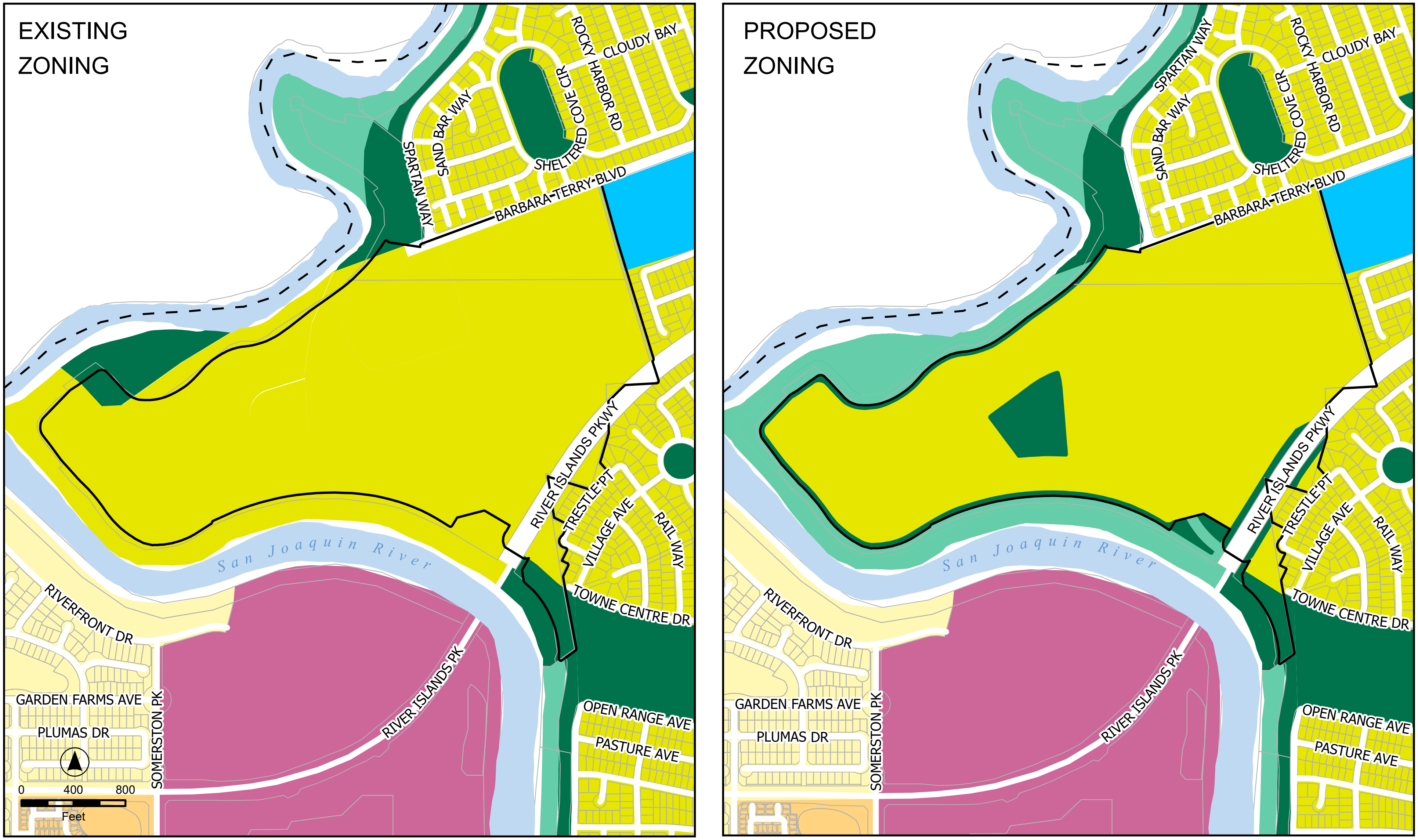
LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 10. Existing and Proposed General Plan Land Use Designations

Source: City of Lathrop; San Joaquin County GIS. Map date: March 20, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.



Legend

- Project Boundary
- Lathrop City Boundary
- OS-MV
- P-MV
- P/QP-MV
- RL-MV
- MU-RI
- RL-RI
- RM-RI

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 11. Existing and Proposed Zoning

Source: City of Lathrop; San Joaquin County GIS. Map date: March 20, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

This page left intentionally blank.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

X	Aesthetics	X	Agriculture and Forestry Resources	X	Air Quality
X	Biological Resources	X	Cultural Resources	X	Energy
X	Geology/Soils	X	Greenhouse Gases	X	Hazards and Hazardous Materials
X	Hydrology/Water Quality	X	Land Use/Planning		Mineral Resources
X	Noise	X	Population/Housing	X	Public Services
X	Recreation	X	Transportation	X	Tribal Cultural Resources
X	Utilities/Service Systems		Wildfire	X	Mandatory Findings of Significance

DETERMINATION

On the basis of this initial evaluation:

	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
X	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

[signature] 3/21/24

Signature Date

Rick Caguiat, CDD Director

EVALUATION INSTRUCTIONS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).
5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
    a) Earlier Analysis Used. Identify and state where they are available for review.
    b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
    c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9) The explanation of each issue should identify:
    a) The significance criteria or threshold, if any, used to evaluate each question; and
    b) The mitigation measure identified, if any, to reduce the impact to less than significant.

EVALUATION OF ENVIRONMENTAL IMPACTS

In each area of potential impact listed in this section, there are one or more questions which assess the degree of potential environmental effect. A response is provided to each question using one of the four impact evaluation criteria described below. A discussion of the response is also included.

- Potentially Significant Impact. This response is appropriate when there is substantial evidence that an effect is significant. If there are one or more "Potentially Significant Impact" entries, upon completion of the Initial Study, an EIR is required.
- Less than Significant With Mitigation Incorporated. This response applies when the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact". The Lead Agency must describe the mitigation measures and briefly explain how they reduce the effect to a less than significant level.
- Less than Significant Impact. A less than significant impact is one which is deemed to have little or no adverse effect on the environment. Mitigation measures are, therefore, not necessary, although they may be recommended to further reduce a minor impact.
- No Impact. These issues were either identified as having no impact on the environment, or they are not relevant to the project.

ENVIRONMENTAL CHECKLIST

This section of the Initial Study incorporates the most current Appendix "G" Environmental Checklist Form contained in the CEQA Guidelines. Impact questions and responses are included in both tabular and narrative formats for each of the 21 environmental topic areas.

I. AESTHETICS

Except as provided in Public Resources Code Section 21099, would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Have a substantial adverse effect on a scenic vista?	X			
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	X			
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with the applicable zoning and other regulations governing scenic quality?	X			
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	X			

Responses to Checklist Questions

Responses a-d) The proposed Project includes development of up to 912 residential units as well as parkland, circulation improvements, and utility improvements, which would alter the existing condition of the largely undeveloped land previously used for agricultural purposes and introduce new sources of light and glare to the site. A scenic vista is generally described as a clear, expansive public view of significant regional features possessing visual and aesthetic qualities of value to the community.

It has been determined that the potential impacts on aesthetics caused by the proposed Project will require a detailed analysis in the EIR. Consequently, the lead agency will examine all of the environmental issues listed in the checklist above (a – d) in the EIR and will decide whether the proposed Project has the potential to have a significant impact on aesthetics. At this point, a definitive impact conclusion for each of these environmental topics will not be made. Rather, all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will include a visual analysis that presents the methodology, thresholds of significance, a project-level impact analysis, a cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to reduce any potential impacts on aesthetics. The analysis will look at foreground, middleground, and background views from public vantage points along the perimeter of the Project site. The analysis will include photographs from public vantage points, architectural elevations of the buildings, an evaluation of the building materials for reflective values/glare, and an evaluation of the lighting and the potential for light pollution offsite. The EIR will also compare the proposed Project to applicable zoning and other regulations related to scenic qualities.

II. AGRICULTURE AND FORESTRY RESOURCES

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	X			
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	X			
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1222(g)) or timberland (as defined in Public Resources Code section 4526)?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	X			

Responses to Checklist Questions

Responses a), b), e): It has been determined that the potential impacts on agricultural resources caused by the proposed Project will require a more detailed analysis in the EIR. As such, the lead agency will examine each of the environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project will have a potentially significant impact on agriculture resources. At this point, a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will describe the character of the region's agricultural lands, including maps of prime farmlands, other important farmland classifications, and protected farmland (including Williamson Act contracts). The County Agricultural Commissioner's Office and the State Department of Conservation will be consulted and their respective plans, policies, laws, and regulations affecting agricultural lands will be presented within the analysis.

The EIR will include thresholds of significance, a project-level impact analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to offset the loss of agricultural lands and/or Williamson Act cancellations as a result of Project implementation.

Responses c), d): There are no forest resources or zoning for forest lands located on the Project site. This CEQA topic is not relevant to the proposed Project and does not require further analysis. Therefore, there would be ***no impact*** regarding the loss of forest or timber resources.

III. AIR QUALITY

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Conflict with or obstruct implementation of the applicable air quality plan?	X			
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	X			
c) Expose sensitive receptors to substantial pollutant concentrations?	X			
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	X			

Existing Setting

The Project site is located within the SJVAPCD. This agency is responsible for monitoring air pollution levels and ensuring compliance with federal and state air quality regulations within the San Joaquin Valley Air Basin (SJVAB) and has jurisdiction over most air quality matters within its borders.

The SJVAPCD has primary responsibility for compliance with both the federal and state standards and for ensuring that air quality conditions are maintained. They do this through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues.

Activities of the SJVAPCD include the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, issuance of permits for stationary sources of air pollution (i.e., Authority to Construct and Permit to Operate), inspection of stationary sources of air pollution and response to citizen complaints, monitoring of ambient air quality and meteorological conditions, and implementation of programs and regulations required by the Federal Clean Air Act and California Clean Air Act.

The SJVAPCD has prepared the *2007 Ozone Plan* to achieve Federal and State standards for improved air quality in the SJVAB regarding ozone. The *2007 Ozone Plan* provides a comprehensive list of regulatory and incentive-based measures to reduce emissions of ozone and particulate matter precursors throughout the SJVAB. The 2007 Ozone Plan calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution. The *2007 Ozone Plan* calls for a 75-percent reduction in ozone-forming oxides of nitrogen emissions.

The SJVAPCD has also prepared the *2007 PM_{10} Maintenance Plan and Request for Redesignation* (2007 PM_{10} Plan). On April 24, 2006, the SJVAPCD submitted a Request for Determination of PM_{10} Attainment for the Basin to the California Air Resources Board (CARB). CARB concurred with the request and submitted the request to the U.S. EPA on May 8, 2006. On October 30, 2006, the EPA issued a Final Rule determining that the Basin had attained the National Ambient Air Quality Standards (NAAQS) for PM_{10}. However, the EPA noted that the Final Rule did not constitute a redesignation to attainment until all of the Federal Clean Air Act requirements under Section 107(d)(3) were met.

The SJVAPCD has prepared the *2008 PM.2.5 Plan* to achieve Federal and State standards for improved air quality in the San Joaquin Valley Air Basin. The *2008 PM.2.5 Plan* provides a comprehensive list of regulatory and incentive-based measures to reduce PM2.5.

In addition to the *2007 Ozone Plan, the 2008 $PM_{2.5}$ Plan,* and the *2007 PM_{10} Plan*, the SJVAPCD prepared the *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI). The GAMAQI is an advisory document that provides Lead Agencies, consultants, and project applicants with analysis guidance and uniform procedures for addressing air quality impacts in environmental documents. Local jurisdictions are not required to utilize the methodology outlined therein. This document describes the criteria that SJVAPCD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for determining whether or not projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts. An update of the GAMAQI was approved on March 19, 2015, and is used as a guidance document for this analysis.

The GAMAQI notes that, for CEQA purposes, a sensitive receptor is generically defined as a location where human populations, especially children, seniors, and sick persons are found, and there is reasonable expectation of continuous human exposure according to the averaging period for the Ambient Air Quality Standards (e.g., 24-hour, 8- hour, 1-hour). These typically include residences, hospitals, and schools. Locations of sensitive receptors may or may not correspond with the location of the maximum off-site concentration.

Responses to Checklist Questions

Responses a-d): Based on the current air quality conditions in the SJVAB, as well as the number of proposed residential units, it has been determined that the potential impacts on air quality caused by the proposed Project will require a detailed analysis in the EIR. As such, the lead agency will examine each of the environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project has the potential to have a significant impact on air quality. At this point, a definitive impact conclusion for each of these environmental topics will not be made. Rather, all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will include an air quality analysis that presents the methodology, thresholds of significance, a project-level impact analysis, a cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to reduce any potential impacts on air quality. The Project may result in toxic air contaminants, short-term construction-related emissions, and long-term operational emissions, primarily attributable to emissions from vehicle trips and from energy consumption by the industrial uses. The air quality analysis will include the following:

- A description of regional and local air quality as well as meteorological conditions that could affect air pollutant dispersal or transport in the vicinity of the Project site. Applicable air quality regulatory framework, standards, and significance thresholds will be discussed.
- An analysis of the proposed Project's potential to conflict with or obstruct implementation of SJVAPCD's 2015 GAMAQI, and any other applicable air quality plans.

- An analysis of the SJVAPCD Rules and Regulations that are applicable to the proposed Project.
- Short-term (i.e., construction) increases in regional criteria air pollutants will be quantitatively assessed. The latest version of the CARB-approved California Emissions Estimator Model (CalEEMod) computer model will be used to estimate regional mobile source and particulate matter emissions associated with the construction of the proposed Project.
- Long-term (i.e., operational) increases in regional criteria air pollutants will be quantitatively assessed for area source, mobile sources, and stationary sources. The CARB-approved CalEEMod computer model will be used to estimate emissions associated with the proposed Project. Modeling will be provided for the worst-case proposed Project land use scenario.
- Exposure to odorous or toxic air contaminants during the Project's operational phase will be assessed through an air toxics health risk assessment, utilizing AERMOD and HARP-2 risk modeling software, following guidance as provided by the SJVAPCD and the CARB. Incremental cancer risk for residents and workers, and chronic and acute hazards will be assessed.
- Local mobile-source (carbon monoxide) (CO) concentrations will be assessed through a CO screening method as recommended by the SJVAPCD. If the screening method indicates that modeling is necessary, upon review of the traffic analysis, CO concentrations will be modeled using the California Department of Transportation (Caltrans)-approved CALINE4 computer model.
- The potential for the proposed Project to generate objectionable odors on neighboring sensitive receptors will be assessed qualitatively following CARB recommendations.

IV. BIOLOGICAL RESOURCES

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	X			
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	X			
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	X			
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	X			
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	X			
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	X			

Responses to Checklist Questions

Responses a-f): Based on the documented special status species, sensitive natural communities, wetlands, and other biological resources in the region, it has been determined that the potential impacts on biological resources caused by the proposed Project will require a detailed analysis. As such, the lead agency will examine each of the environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project has the potential to have a significant impact on biological resources. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will provide a summary of local biological resources, including descriptions and mapping of plant communities, the associated plant and wildlife species, and sensitive biological resources known to occur, or with the potential to occur in the Project vicinity. The analysis will conclude with a project-level impact analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented in order to reduce any significant impacts on biological resources.

V. CULTURAL RESOURCES

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Cause a substantial adverse change in the significance of a historical resource pursuant to '15064.5?	X			
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?	X			
c) Disturb any human remains, including those interred outside of formal cemeteries?	X			

Responses to Checklist Questions

Responses a-c): Based on known historical and archaeological resources in the region, and the potential for undocumented underground cultural resources in the region, it has been determined that the potential impacts on cultural resources caused by the proposed Project will require a detailed analysis in the EIR. As such, the lead agency will examine each of the environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project has the potential to have a significant impact on cultural resources. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will include an overview of the prehistory and history of the area, the potential for surface and subsurface cultural resources to be found in the area, the types of cultural resources that may be expected to be found, a review of existing regulations and policies that protect cultural resources, an impact analysis, and mitigation that should be implemented in order to reduce any significant impacts to cultural resources. In addition, the CEQA process will include a request to the Native American Heritage Commission for a list of local Native American groups that should be contacted relative to this Project. The CEQA process will also include consultation with any Native American groups that have requested consultation with the City of Lathrop.

VI. ENERGY

Would the project:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	X			
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	X			

Responses to Checklist Questions

Responses a-b): Appendix F of the State CEQA Guidelines requires consideration of the potentially significant energy implications of a project. CEQA requires mitigation measures to reduce "wasteful, inefficient and unnecessary" energy usage (Public Resources Code Section 21100, subdivision [b][3]). According to Appendix F of the CEQA Guidelines, the means to achieve the goal of conserving energy include decreasing overall energy consumption, decreasing reliance on natural gas and oil, and increasing reliance on renewable energy sources. In particular, the proposed Project would be considered "wasteful, inefficient, and unnecessary" if it were to violate state and federal energy standards and/or result in significant adverse impacts related to Project energy requirements, energy inefficiencies, energy intensiveness of materials, cause significant impacts on local and regional energy supplies or generate requirements for additional capacity, fail to comply with existing energy standards, otherwise result in significant adverse impacts on energy resources, or conflict or create an inconsistency with applicable plan, policy, or regulation.

Due to the size of the proposed Project site and number of residential units resulting from the Project, the potential impacts on energy caused by the proposed Project will require a detailed analysis in the EIR. Consequently, the lead agency will examine each of the environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project has the potential to have a significant impact on energy resources. The EIR will include a discussion and analysis that provides calculated levels of energy use expected for the proposed Project, based on commonly used modelling software (i.e. CalEEMod and the CARB's EMFAC). At this point, a definitive impact conclusion for each of these environmental topics will not be made. Rather, all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

VII. GEOLOGY AND SOILS

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation***	***Less Than Significant Impact***	***No Impact***
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	X			
ii) Strong seismic ground shaking?	X			
iii) Seismic-related ground failure, including liquefaction?	X			
iv) Landslides?	X			
b) Result in substantial soil erosion or the loss of topsoil?	X			
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	X			
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	X			
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	X			

Responses to Checklist Questions

Responses a.i-a.iv, b, c, d, f): It has been determined that the potential impacts from geology and soils will require a detailed analysis in the EIR. As such, the lead agency will examine each of the potentially significant environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project has the potential to have a significant impact from geology and soils. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will include a review of existing geotechnical reports, published documents, aerial photos, geologic maps, and other geological and geotechnical literature pertaining to the site and surrounding area to aid in evaluating geologic resources and geologic hazards that may be present. The EIR will include a description of the applicable regulatory setting, a description of the existing geologic and soils conditions on and around the Project site, an evaluation of geologic hazards, a description of the nature and general engineering characteristics of the subsurface conditions within the Project site, and the provision of findings and potential mitigation strategies to address any geotechnical concerns or potential hazards.

This section will provide an analysis including thresholds of significance, a Project -level impact analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to reduce any significant impacts associated with geology and soils.

Response e): The proposed Project would connect to the municipal sewer system for wastewater disposal. Septic tanks or septic systems are not proposed as part of the Project. As such, this CEQA topic is not relevant to the proposed Project and does not require further analysis. Therefore, there would be ***no impact*** regarding septic tanks or alternative wastewater disposal systems.

VIII. GREENHOUSE GAS EMISSIONS

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	X			
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?	X			

Responses to Checklist Questions

Responses a), b): Implementation of the proposed Project could generate greenhouse gases (GHGs) from a variety of sources, including but not limited to vehicle trips, electricity consumption, water use, and solid waste generation. It has been determined that the potential impacts from GHG emissions by the proposed Project will require a detailed analysis in the EIR. As such, the lead agency will examine each of the environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project has the potential to have a significant impact from GHG emissions. At this point, a definitive impact conclusion for each of these environmental topics will not be made. Rather, all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will include a GHG emissions analysis pursuant to the requirements of the California Governor's Executive Order S-3-05 and The Global Warming Solutions Act of 2006 (AB 32), Senate Bill 375 (SB 375), and Senate Bill 32 (SB 32). The analysis will follow the California Air Pollution Control Officers Association (CAPCOA) white paper methodology and recommendations presented in "Climate Change and CEQA", which was prepared in coordination with the CARB and the Governor's Office of Planning and Research (OPR) as a common platform for public agencies to ensure that GHG emissions are appropriately considered and addressed under CEQA. Also, a GHG emissions analysis using the SJVAPCD's two-tiered approach in assessing significance of the Project specific GHG emissions increases will be performed. These analyses will consider a regional approach toward determining whether GHG emissions are significant, and will present mitigation measures to reduce any potential impacts. The discussion and analysis will include quantification of GHGs generated by the Project using the CalEEMod computer model as well as a qualitative discussion of the Project's consistency with any applicable state and local plans to reduce the impacts of climate change.

IX. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	X			
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	X			
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	X			
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	X			
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	X			
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	X			
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			X	

Responses to Checklist Questions

Responses a-f): It has been determined that the potential impacts from hazards and/or hazardous materials by the proposed Project will require a detailed analysis in the EIR. As such, the lead agency will examine each of the environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project has the potential to have a significant impact from hazards and/or hazardous materials. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will include a review of existing environmental site assessments and any other relevant studies for the Project site to obtain a historical record of environmental conditions. The environmental hazards evaluation will include a review of hazardous site databases. A site reconnaissance will be performed to observe the site and potential areas of interest. The potential for Project implementation to introduce hazardous materials to and from the area during construction and operation will be assessed. If environmental conditions are identified, mitigation measures, as applicable, will be identified to address the environmental conditions.

This section will provide an analysis including the methodology, thresholds of significance, a consistency analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to reduce impacts associated with hazards and hazardous materials.

Response g): The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents) and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point.

The Project site and surrounding area are not located within an area identified as a fire hazard severity zone by the Fire Hazard Severity Zones Maps prepared by Cal Fire.[1] This is a ***less than significant*** impact, and no additional analysis of this CEQA topic is warranted.

[1] Cal Fire, *Fire Hazard Severity Zone Maps*, https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones/fire-hazard-severity-zones-maps, accessed February 2, 2024.

X. HYDROLOGY AND WATER QUALITY

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	X			
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	X			
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
(i) result in substantial erosion or siltation on- or off-site;	X			
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	X			
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems to provide substantial additional sources of polluted runoff; or	X			
(iv) impede or redirect flood flows?	X			
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	X			
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	X			

Responses to Checklist Questions

Responses a-e): Human activities have an effect on water quality when chemicals, heavy metals, hydrocarbons (auto emissions and car crank case oil), and other materials are transported with storm water into drainage systems. Construction activities can increase sediment runoff, including concrete waste and other pollutants.

It has been determined that the potential impacts on hydrology and water quality caused by the proposed Project will require a detailed analysis in the EIR. As such, the lead agency will examine each of the potentially significant environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project has the potential to have a significant impact on hydrology and water quality. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

This section of the EIR will provide an analysis including the methodology, thresholds of significance, a project-level impact analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to reduce any potential impacts associated with hydrology and water quality.

The EIR will present the Project's hydrology and hydraulic calculations under existing and proposed conditions. Some of the specific items to be reviewed may include: land use classification; acreage calculations; runoff coefficients; time of concentration; and methodology. Calculations will be reviewed for reasonableness and consistency with the site plan and with the City's master plans. This section will describe the surface drainage patterns of the Project site and adjoining areas, and identify surface water quality in the Project site based on existing and available data. The EIR will also evaluate the potential construction and operational impacts of the proposed Project on water quality, including surface water and groundwater. The potential for substantial erosion on-site and dam inundation will be analyzed. The potential for the proposed Project to substantially decrease groundwater supplies or interfere with groundwater recharge will also be analyzed. This section will also identify 303(D)-listed impaired water bodies in the vicinity of the Project site. Conformity of the proposed Project to water quality regulations and the Project site's potential to be inundated by seiche or tsunami will also be discussed. Mitigation measures will be developed to incorporate Best Management Practices (BMPs), and any other applicable local, state, and federal requirements to reduce the potential for site runoff.

XI. LAND USE AND PLANNING

Would the project:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Physically divide an established community?				X
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	X			

Responses to Checklist Questions

Response a): The Project site is located in Lathrop. Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

The Project would result in an extension of developed uses within an area of the City that currently has approved development plans within the vicinity of the Project site. Development of the Project site would not result in physical barriers, such as a highway, wall, or other division, that would divide an existing community, but would serve as an orderly extension of existing and planned development. The Project would have ***no impact*** in regards to the physical division of an established community. This topic does not warrant additional analysis and will not be addressed further in the EIR.

Response b): It has been determined that the potential impact related to conflicts with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect caused by the proposed Project will require a detailed analysis in the EIR. Consequently, the lead agency will analyze this environmental issue in the EIR and will decide whether the proposed Project has the potential to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. At this point, a definitive impact conclusion for this environmental topic will not be made. Rather, this topic is considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

This section will provide an analysis including the thresholds of significance, a project-level impact analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to reduce any identified significant effects.

XII. MINERAL RESOURCES

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

Responses to Checklist Questions

Responses a-b): According to Figure 3.11-1 of the City's General Plan Draft EIR, the Project site is not located in Mineral Resources Zones 1 or 2. Given this finding, the likelihood that implementation of the proposed Project would result in the loss of availability of a known valuable mineral resource or the loss of availability of a locally important mineral resource recovery site is considered low. Additionally, impacts to mineral resources as a result of General Plan buildout (including development of the Project site with residential uses) were analyzed in the General Plan EIR. Therefore, there is ***no impact*** related to mineral resources. This topic does not warrant additional analysis and will not be addressed further in the EIR.

XIII. NOISE

Would the project result in:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Generation of a temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	X			
b) Generation of excessive groundborne vibration or groundborne noise levels?	X			
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	X			

Responses to Checklist Questions

Responses a-c): Based on existing and projected noise levels along roadways, and the potential for noise generated during Project construction and operational activities, it has been determined that the potential impacts from noise caused by the proposed Project will require a detailed analysis in the EIR. As such, the lead agency will examine each of the two potentially significant environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project has the potential to have a significant impact from noise. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather both are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will include a noise study. The noise study will identify the noise level standards contained in the City of Lathrop General Plan Noise Element which are applicable to this Project, as well as any state and federal standards. The EIR will address the existing noise environment, including an evaluation of existing ambient noise levels. Existing noise levels due to the local roadway network will be quantified. The Federal Highway Administration (FHWA) traffic noise prediction model will be used for the prediction of traffic noise levels. The EIR will also analyze mobile noise generated by the Project, including noise from on-site activities on the nearest noise-sensitive receptors. The noise study will also include an analysis of the noise and vibration impacts associated with construction of the Project and any infrastructure outside of the Project site. The study will present appropriate and practical recommendations for noise control aimed at reducing any noise impacts.

The EIR will include thresholds of significance, a consistency analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to reduce impacts associated with noise.

XIV. POPULATION AND HOUSING

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	X			
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	X			

Responses to Checklist Questions

Responses a-b): It has been determined that the potential population and housing impacts caused by the proposed Project will require a detailed analysis in the EIR. As such, the lead agency will examine each of these environmental issues in the environmental impact report and will decide whether the proposed Project has the potential to have a significant impact. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the environmental impact report.

The EIR will include a detailed discussion of the Project characteristics as it relates to the existing General Plan Housing Element, and other local regulations. The local, regional, state, and federal jurisdictions potentially affected by the Project will be identified, as well as their respective plans, policies, laws, and regulations, and potentially sensitive land uses. The proposed Project will be evaluated for consistency the City of Lathrop General Plan, the Zoning Ordinance, and other local planning documents. Planned development and housing and population trends in the region will be identified based on currently available plans.

This section will provide an analysis including the thresholds of significance, a consistency analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to ensure population and housing consistency with the existing and planned land uses.

XV. PUBLIC SERVICES

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i) Fire protection?	X			
ii) Police protection?	X			
iii) Schools?	X			
iv) Parks?	X			
v) Other public facilities?	X			

Responses to Checklist Questions

Responses a)i-a)v: Implementation of the proposed Project would result in increased demand for police, fire protection, schools, parks, and other public facilities in the area. It has been determined that the potential impacts from increased demands on public services caused by the proposed Project will require a detailed analysis in the environmental impact report. As such, the lead agency will examine each of these five environmental issues listed in the checklist above in the environmental impact report and will decide whether the proposed Project has the potential to have a significant impact on public services. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the environmental impact report.

During the preparation of the environmental impact report, the public service providers will be consulted in order to determine existing service levels in the Project areas. This would include documentation regarding existing staff levels, equipment and facilities, current service capacity, existing service boundaries, and planned service expansions. Master plans from such public service providers and City policies, programs, and standards associated with the provision of public services will be presented in the environmental impact report.

The environmental impact report will provide an analysis including the thresholds of significance, a consistency analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented reduce impacts associated with public services.

XVI. RECREATION

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	X			
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	X			

Responses to Checklist Questions

Responses a-b): Implementation of the proposed Project would result in increased demand for parks, and other recreational facilities in the area. It has been determined that the potential impacts from increased demands to recreation facilities caused by the proposed Project will require a detailed analysis in the environmental impact report. As such, the lead agency will examine each of these environmental issues listed in the checklist above in the environmental impact report, and will decide whether the proposed Project has the potential to have a significant impact on recreational facilities. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the environmental impact report.

During the preparation of the environmental impact report, the recreational facilities and services will be analyzed to determine existing service levels in the Project areas. This would include documentation regarding existing and future facility needs, current service capacity, and planned service expansions. City policies, programs, and standards associated with the provision of public services will be presented in the environmental impact report.

The environmental impact report will provide an analysis including the thresholds of significance, a consistency analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented reduce impacts associated with public services.

XVII. TRANSPORTATION

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	X			
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	X			
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	X			
d) Result in inadequate emergency access?	X			

Responses to Checklist Questions

Response a-d): The proposed Project includes the development of uses that will increase traffic on existing and planned roadways. Based on existing and projected traffic volume levels along roadways and potential increases in vehicle miles travelled as a result of the Project, it has been determined that traffic impacts will require a detailed analysis in the EIR. As such, the lead agency will examine each of the environmental issues listed in the checklist above in the EIR and will determine whether the proposed Project has the potential to have a significant impact from traffic. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is conducted in the EIR.

The EIR will include a Traffic Impact Analysis (TIA) to address the impacts of the proposed Project on the surrounding transportation system including the roadways, transit service, pedestrian facilities, and bicycle facilities. The TIA will be conducted to address compliance with the City's General Plan and other requirements under CEQA. It will be prepared following applicable guidelines of the City of Lathrop, San Joaquin County, and Caltrans, as applicable. The EIR will analyze total vehicle trips and associated vehicle-miles-traveled (VMT) that are modeled to be generated by the proposed Project. Potential impacts associated with roadway access, on-site circulation, and consistency with CEQA Guidelines section 15064.3, subdivision (b) will also be addressed in the EIR. Significant impacts will be identified in accordance with the established criteria, and mitigation measures will be identified to lessen the significance of any potential impacts.

The EIR will provide an analysis including the thresholds of significance, a project-level impact analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to reduce any significant impacts associated with transportation.

XVIII. TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?	X			
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resources to a California Native American tribe.	X			

Responses to Checklist Questions

Responses a-b): Based on known historical, cultural, tribal, and archaeological resources in the region, and the potential for undocumented underground cultural resources in the region, it has been determined that the potential impacts on tribal cultural resources caused by the proposed Project will require a detailed analysis in the EIR. As such, the lead agency will examine the environmental issues listed in the checklist above in the EIR and will decide whether the proposed Project has the potential to have a significant impact on tribal cultural resources. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will include an overview of the prehistory and history of the area, the potential for surface and subsurface tribal cultural resources to be found in the area, the types of tribal cultural resources that may be expected to be found, a review of existing regulations and policies that protect tribal cultural resources, an impact analysis, and mitigation that should be implemented in order to reduce potential impacts to tribal cultural resources. In addition, the CEQA process will include a request to the Native American Heritage Commission for a list of local Native American groups that should be contacted relative to this Project, as per the requirements of AB 52. The CEQA process will also include consultation with any Native American groups that have requested consultation with the City of Lathrop.

XIX. UTILITIES AND SERVICE SYSTEMS

Would the project:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	X			
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	X			
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments?	X			
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reductions goals?	X			
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	X			

Responses to Checklist Questions

Responses a-e): Implementation of the proposed Project would result in increased demands for utilities to serve the Project. As such, the EIR will examine each of the environmental issues listed in the checklist above and will decide whether the proposed Project has the potential to have a significant impact to utilities and service systems. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

The EIR will analyze wastewater, water, and storm drainage infrastructure, as well as other utilities (i.e. solid waste, gas, electric, etc.), that are needed to serve the proposed Project. The wastewater assessment will include a discussion of the proposed collection and conveyance system, treatment methods and capacity at the treatment plants, disposal location(s) and methods, and the potential for recycled water use for irrigation in the future. The EIR will analyze the impacts associated with on-site construction of the conveyance system, including temporary impacts associated with the construction phase. The proposed infrastructure will be presented. The EIR will provide a discussion of the wastewater treatment plants that are within proximity to the Project site, including current demand and capacity at these plants. The analysis will discuss the disposal methods and location, including environmental impacts and permit requirements associated with disposal of treated wastewater.

The storm drainage assessment will include a discussion of the proposed drainage collection system including impacts associated with on-site construction of the storm drainage system. The

EIR will identify permit requirements and mitigation needed to minimize and/or avoid impacts. The proposed infrastructure will be presented.

The EIR will include an assessment for consistency with City Master Plans and Management Plans that are directly related to these utilities.

The EIR will analyze the impacts associated with water supply and on-site and off-site construction of the water system, including temporary impacts associated with the construction phase. The results of a Project-specific Water Supply Assessment will be provided. The EIR will also identify permit requirements and mitigation needed to minimize and/or avoid impacts, and will present the proposed infrastructure as provided by the Project site engineering reports.

The EIR will also address solid waste collection and disposal services for the proposed Project. This will include an assessment of the existing capacity and Project demands. The assessment will identify whether there is sufficient capacity to meet the Project demands.

The EIR will provide thresholds of significance, a project-level impact analysis, cumulative impact analysis, and a discussion of feasible mitigation measures that should be implemented to reduce impacts associated with utilities and service systems.

XX. WILDFIRE

	Potentially Significant Impact	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?			X	
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?			X	
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?			X	
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?			X	

Responses to Checklist Questions

Response a): The Project site and surrounding area are not located in or near state responsibility areas or lands classified as very high fire hazard severity zones. Therefore, this CEQA topic is not relevant to the proposed Project and does not require further analysis. For these reasons, the impacts related to wildfire would be ***less than significant*** and no additional analysis of this CEQA topic is warranted.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	X			
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	X			
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	X			

Responses to Checklist Questions

Responses a-c): It has been determined that the potential for the proposed Project to: substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory; degrade the quality of the environment; create cumulatively considerable impacts; or adversely affect human beings will require more detailed analysis in an EIR. As such, the City of Lathrop will examine each of these environmental issues in the EIR and will decide whether the proposed Project has the potential to have significant impacts on these environmental issues. At this point a definitive impact conclusion for each of these environmental topics will not be made, rather all are considered ***potentially significant*** until a detailed analysis is prepared in the EIR.

REFERENCES

California Department of Conservation. 2015. CGS Information Warehouse: Mineral Land Classification (GIS). Available at: https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=mlc

California Department of Conservation. 2016. California Important Farmland Finder. Available at: https://maps.conservation.ca.gov/DLRP/CIFF/

California Department of Conservation. 2018. DOC Maps: Mines and Mineral Resources. Available at: https://maps.conservation.ca.gov/mineralresources/

California Department of Forestry and Fire Protection. Fire Hazard Severity Zones Maps. https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones/fire-hazard-severity-zones-maps

City of Lathrop. 2022. General Plan City of Lathrop. Adopted September 2022. Available at: https://www.ci.lathrop.ca.us/planning/page/lathrop-general-plan

City of Lathrop. 2022. Lathrop Municipal Code. Current through Ordinance 23-448 and the November 2023 code supplement. Available at: https://ecode360.com/LA4956

APRIL 17, 2024

VIA EMAIL: PLANNING@CI.LATHROP.CA.US
CITY OF LATHROP, COMMUNITY DEVELOPMENT DEPARTMENT
ATTN: RICK CAGUIAT, COMMUNITY DEVELOPMENT DIRECTOR
390 TOWNE CENTRE DRIVE
LATHROP, CA 95330

Dear Mr. Caguiat:

INITIAL STUDY AND NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE MOSSDALE LANDING WEST SPECIFIC PLAN PROJECT, SCH# 2024030835

The Department of Conservation's (Department) Division of Land Resource Protection (Division) has reviewed the Initial Study and Notice of Preparation of an Environmental Impact Report for the Mossdale Landing West Specific Plan Project (Project).

The Division monitors and maps farmland conversion on a statewide basis, provides technical assistance regarding the Williamson Act, and administers various agricultural land conservation programs. Public Resources Code, section 614, subdivision (b) authorizes the Department to provide soil conservation advisory services to local governments, including review of CEQA documents.

Protection of the state's agricultural land resources is part of the Department's mission and central to many of its programs. The CEQA process gives the Department an opportunity to acknowledge the value of the resource, identify areas of Department interest, and offer information on how to assess potential impacts or mitigation opportunities.

The Department respects local decision-making by informing the CEQA process, and is not taking a position or providing legal or policy interpretation.

We offer the following comments for consideration with respect to the project's potential impacts on agricultural land and resources within the Department's purview.

PROJECT ATTRIBUTES

The Mossdale Landing West Specific Plan (Specific Plan or Project) would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements over five phases. The project site contains Prime Farmland and Farmland of Statewide Importance as designated by DOC's Farmland Mapping and Monitoring Program, and a portion of the project site is subject to a Williamson Act contract.

PROJECT CONSIDERATIONS

The conversion of agricultural land represents a permanent reduction and impact to California's agricultural land resources. The Department generally advises discussion of the following in any environmental review for the loss or conversion of agricultural land:

- Type, amount, and location of farmland conversion resulting directly and indirectly from implementation of the proposed project.
- Impacts on any current and future agricultural operations in the vicinity; e.g., land-use conflicts, increases in land values and taxes, loss of agricultural support infrastructure such as processing facilities, etc.
- Incremental impacts leading to cumulative impacts on agricultural land. This would include impacts from the proposed project, as well as impacts from past, current, and likely future projects.
- Proposed mitigation measures for impacted agricultural lands within the proposed project area.
- The project's compatibility with lands within an agricultural preserve and/or enrolled in a Williamson Act contract.

WILLIAMSON ACT

Where, as here, the project site is located on land subject to a Williamson Act contract, the Department advises that the environmental review discuss the compatibility of the project with the contract and local Williamson Act program requirements.

MITIGATING AGRICULTURAL LAND LOSS OR CONVERSION

Consistent with CEQA Guidelines, the Department advises that the environmental review address mitigation for the loss or conversion of agricultural land. An agricultural conservation easement is one potential method for mitigating loss or conversion of agricultural land. (*See* Cal. Code Regs., tit. 14, § 15370 [mitigation includes "compensating for the impact by replacing or providing substitute resources or environments, including through permanent protection of such resources in the form of conservation easements."]; *see also King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814.)

Mitigation through agricultural conservation easements can take at least two forms: the outright purchase of easements or the donation of mitigation fees to a local, regional, or statewide organization or agency whose purpose includes the acquisition and stewardship of agricultural easements. The conversion of agricultural land may be viewed as an impact of at least regional significance. Hence, the search for replacement lands may not need to be limited strictly to lands within the project's surrounding area. A helpful source for regional and statewide agricultural mitigation banks is the California Council of Land Trusts. They provide helpful insight into farmland mitigation policies and implementation strategies, including a guidebook with model policies and a model local ordinance. The guidebook can be found at:

California Council of Land Trusts

Of course, the use of conservation easements is only one form of mitigation, and the Department urges consideration of any other feasible measures necessary to mitigate project impacts.

Thank you for giving us the opportunity to comment on the Initial Study and Notice of Preparation of an Environmental Impact Report for the Mossdale Landing West Specific Plan Project. Please provide the Department with notices of any future hearing dates as well as any staff reports pertaining to this project. If you have any questions regarding our comments, please contact Farl Grundy, Associate Environmental Planner via email at Farl.Grundy@conservation.ca.gov.

Sincerely,

Monique Wilber

Monique Wilber

Conservation Program Support Supervisor

California Department of Transportation

OFFICE OF THE DISTRICT 10 DIRECTOR
P.O. BOX 2048 | STOCKTON, CA 95201
(209) 948-7943 | FAX (209) 948-7179 TTY 711
www.dot.ca.gov

April 22, 2024

10-SJ-5-PM R016.195
Mossdale Landing West Specific Plan

Rick Caguiat
Community Development Department, Planning Division
City of Lathrop
390 Towne Centre Drive
Lathrop, CA 95330

Dear Mr. Caguiat:

The California Department of Transportation appreciates the opportunity to review the proposed Mossdale Landing residential project. The project proposes 829 residential units though 912 units are assumed in the analysis to provide a residential buffer. The project is east of the San Joaquin River, west of McKeen Blvd, and mostly north of River Islands Parkway. The Department has the following comments:

1. A Transportation Impact Study (TIS) needs to be prepared per Caltrans Transportation Impact Study Guide (Vehicle Miles Traveled-Focus Draft) February 2020, and Governor's Office of Planning and Research's (OPR) Technical Advisory on Evaluating Transportation Impacts in CEQA December 2018. Please submit the Scope of Work for the TIS to Caltrans for review and comment before beginning the study. Upon completion, the TIS must be submitted to Caltrans for review and comment prior to project approval. Trip generation figures, trip distribution figures, traffic volumes, and electronic Synchro/Simtraffic files (version 12) must also be included with the TIS.

2. The following intersections should be studied in the TIS.
    a. Interstate 5/Louise Avenue
    b. Northbound Interstate 5/Mossdale Road
    c. Southbound Interstate 5/Manthey Road

3. Caltrans recommends a Complete Streets approach to planning this development and the surrounding area that promotes bicycle and pedestrian connectivity between the development and neighboring destinations and other nearby destinations. This would include facilities such as bike lanes, crosswalks, and sidewalks.

4. Caltrans recommends that nearby destinations include the facilities necessary to accommodate alternate modes of transportation such as bus stops, bike racks, and solar charging stations for electric vehicles.

If you have any questions or would like to set up a meeting to further discuss this project, please contact me at 209-483-2582 or Nicholas Fung at (209) 986-1552.

Sincerely,

Nicholas Fung
FOR
Tom Dumas
Chief, Office of Metropolitan Planning

Central Valley Regional Water Quality Control Board

22 April 2024

Rick Caguiat
City of Lathrop
390 Towne Centre Drive
Lathrop, AZ 95330
planning@ci.lathrop.ca.us

COMMENTS TO REQUEST FOR REVIEW FOR THE NOTICE OF PREPARATION FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, MOSSDALE LANDING WEST SPECIFIC PLAN, SCH#2024030835, SAN JOAQUIN COUNTY

Pursuant to the State Clearinghouse's 22 March 2024 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Notice of Preparation for the Draft Environmental Impact Report* for the Mossdale Landing West Specific Plan, located in San Joaquin County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

I. Regulatory Setting

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin Plan amendments. Once the Central Valley Water Board has adopted a Basin Plan amendment in noticed public hearings, it must be approved by

the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (USEPA). Basin Plan amendments only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues. For more information on the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, please visit our website:
http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

Antidegradation Considerations

All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at:
https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf

In part it states:

Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

II. Permitting Requirements

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit), Construction General Permit Order No. 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). For more information on the Construction General Permit, visit the State Water Resources Control Board website at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements. If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

401 Water Quality Certifications. For more information on the Water Quality Certification, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

Waste Discharge Requirements – Discharges to Waters of the State

If USACE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at:https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/

Projects involving excavation or fill activities impacting less than 0.2 acre or 400 linear feet of non-jurisdictional waters of the state and projects involving dredging activities impacting less than 50 cubic yards of non-jurisdictional waters of the state may be eligible for coverage under the State Water Resources Control Board Water Quality Order No. 2004-0004-DWQ (General Order 2004-0004). For more information on the General Order 2004-0004, visit the State Water Resources Control Board website at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2004/wqo/wqo2004-0004.pdf

Dewatering Permit

If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Threat General Order) 2003-0003 or the Central Valley Water Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Threat Waiver) R5-2018-0085. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at: http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Threat Waiver and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2018-0085.pdf

Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Limited Threat Discharges to Surface Water* (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain coverage under the Limited Threat General Order. For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf

NPDES Permit

If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit. For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/help/permit/

If you have questions regarding these comments, please contact me at (916) 464-4684 or Peter.Minkel2@waterboards.ca.gov.

Peter G. Minkel

Peter G. Minkel
Engineering Geologist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov

March 25, 2024

Rick Caguiat
City of Lathrop
390 Towne Center Drive
Lathrop CA 95330

Re: 2024030835, Mossdale Landing West Specific Plan Project, San Joaquin County

Dear Mr. Caguiat:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

a. A brief description of the project.
b. The lead agency contact information.
c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

a. Alternatives to the project.
b. Recommended mitigation measures.
c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

a. Type of environmental review necessary.
b. Significance of the tribal cultural resources.
c. Significance of the project's impacts on tribal cultural resources.
d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
   a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
   b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (https://ohp.parks.ca.gov/?page_id=30331) for an archaeological records search. The records search will determine:
   a. If part or all of the APE has been previously surveyed for cultural resources.
   b. If any known cultural resources have already been recorded on or adjacent to the APE.
   c. If the probability is low, moderate, or high that cultural resources are located in the APE.
   d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
   a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
   b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:

a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.

b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.

a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.

b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.

c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Pricilla.Torres-Fuentes@NAHC.ca.gov.

Sincerely,

Pricilla Torres-Fuentes

Pricilla Torres-Fuentes
Cultural Resources Analyst

cc: State Clearinghouse

Pacific Gas and Electric Company

Plan Review Team
Land Management

PGEPlanReview@pge.com

May 8, 2024

Maria Hermosilla
City of Lathrop
390 Towne Centre Drive
Lathrop, CA 95330

Re: Mossdale Landing West Specific Plan

Dear Maria Hermosilla,

Thank you for providing PG&E the opportunity to review the proposed plans for Mossdale Landing West dated 3/22/2024. Our review indicates the proposed improvements do not appear to directly interfere with existing PG&E facilities or impact our easement rights.

Please note this is our preliminary review and PG&E reserves the right for additional future review as needed. This letter shall not in any way alter, modify, or terminate any provision of any existing easement rights. If there are subsequent modifications made to the design, we ask that you resubmit the plans to the email address listed below.

If the project requires PG&E gas or electrical service in the future, please continue to work with PG&E's Service Planning department: https://www.pge.com/cco/.

As a reminder, before any digging or excavation occurs, please contact Underground Service Alert (USA) by dialing 811 a minimum of 2 working days prior to commencing any work. This free and independent service will ensure that all existing underground utilities are identified and marked on-site.

If you have any questions regarding our response, please contact the PG&E Plan Review Team at pgeplanreview@pge.com.

Sincerely,

PG&E Plan Review Team
Land Management

Pacific Gas and Electric Company

Plan Review Team
Land Management

PGEPlanReview@pge.com

March 27, 2024

Maria Hermosilla
City of Lathrop
390 Towne Centre Drive
Lathrop, CA 95330

Ref: Gas and Electric Transmission and Distribution

Dear Maria Hermosilla,

Thank you for submitting the Mossdale Landing West Specific plans for our review. PG&E will review the submitted plans in relationship to any existing Gas and Electric facilities within the project area. If the proposed project is adjacent/or within PG&E owned property and/or easements, we will be working with you to ensure compatible uses and activities near our facilities.

Attached you will find information and requirements as it relates to Gas facilities (Attachment 1) and Electric facilities (Attachment 2). Please review these in detail, as it is critical to ensure your safety and to protect PG&E's facilities and its existing rights.

Below is additional information for your review:

1. This plan review process does not replace the application process for PG&E gas or electric service your project may require. For these requests, please continue to work with PG&E Service Planning: https://www.pge.com/en_US/business/services/building-and-renovation/overview/overview.page.

2. If the project being submitted is part of a larger project, please include the entire scope of your project, and not just a portion of it. PG&E's facilities are to be incorporated within any CEQA document. PG&E needs to verify that the CEQA document will identify any required future PG&E services.

3. An engineering deposit may be required to review plans for a project depending on the size, scope, and location of the project and as it relates to any rearrangement or new installation of PG&E facilities.

Any proposed uses within the PG&E fee strip and/or easement, may include a California Public Utility Commission (CPUC) Section 851 filing. This requires the CPUC to render approval for a conveyance of rights for specific uses on PG&E's fee strip or easement. PG&E will advise if the necessity to incorporate a CPUC Section 851filing is required.

This letter does not constitute PG&E's consent to use any portion of its easement for any purpose not previously conveyed. PG&E will provide a project specific response as required.

Sincerely,

Plan Review Team
Land Management

Attachment 1 – Gas Facilities

There could be gas transmission pipelines in this area which would be considered critical facilities for PG&E and a high priority subsurface installation under California law. Care must be taken to ensure safety and accessibility. So, please ensure that if PG&E approves work near gas transmission pipelines it is done in adherence with the below stipulations. Additionally, the following link provides additional information regarding legal requirements under California excavation laws: https://www.usanorth811.org/images/pdfs/CA-LAW-2018.pdf

1. Standby Inspection: A PG&E Gas Transmission Standby Inspector must be present during any demolition or construction activity that comes within 10 feet of the gas pipeline. This includes all grading, trenching, substructure depth verifications (potholes), asphalt or concrete demolition/removal, removal of trees, signs, light poles, etc. This inspection can be coordinated through the Underground Service Alert (USA) service at 811. A minimum notice of 48 hours is required. Ensure the USA markings and notifications are maintained throughout the duration of your work.

2. Access: At any time, PG&E may need to access, excavate, and perform work on the gas pipeline. Any construction equipment, materials, or spoils may need to be removed upon notice. Any temporary construction fencing installed within PG&E's easement would also need to be capable of being removed at any time upon notice. Any plans to cut temporary slopes exceeding a 1:4 grade within 10 feet of a gas transmission pipeline need to be approved by PG&E Pipeline Services in writing PRIOR to performing the work.

3. Wheel Loads: To prevent damage to the buried gas pipeline, there are weight limits that must be enforced whenever any equipment gets within 10 feet of traversing the pipe.

Ensure a list of the axle weights of all equipment being used is available for PG&E's Standby Inspector. To confirm the depth of cover, the pipeline may need to be potholed by hand in a few areas.

Due to the complex variability of tracked equipment, vibratory compaction equipment, and cranes, PG&E must evaluate those items on a case-by-case basis prior to use over the gas pipeline (provide a list of any proposed equipment of this type noting model numbers and specific attachments).

No equipment may be set up over the gas pipeline while operating. Ensure crane outriggers are at least 10 feet from the centerline of the gas pipeline. Transport trucks must not be parked over the gas pipeline while being loaded or unloaded.

4. Grading: PG&E requires a minimum of 36 inches of cover over gas pipelines (or existing grade if less) and a maximum of 7 feet of cover at all locations. The graded surface cannot exceed a cross slope of 1:4.

5. Excavating: Any digging within 2 feet of a gas pipeline must be dug by hand. Note that while the minimum clearance is only 24 inches, any excavation work within 24 inches of the edge of a pipeline must be done with hand tools. So to avoid having to dig a trench entirely with hand tools, the edge of the trench must be over 24 inches away. (Doing the math for a 24 inch

wide trench being dug along a 36 inch pipeline, the centerline of the trench would need to be at least 54 inches [24/2 + 24 + 36/2 = 54] away, or be entirely dug by hand.)

Water jetting to assist vacuum excavating must be limited to 1000 psig and directed at a 40° angle to the pipe. All pile driving must be kept a minimum of 3 feet away.

Any plans to expose and support a PG&E gas transmission pipeline across an open excavation need to be approved by PG&E Pipeline Services in writing PRIOR to performing the work.

6. Boring/Trenchless Installations: PG&E Pipeline Services must review and approve all plans to bore across or parallel to (within 10 feet) a gas transmission pipeline. There are stringent criteria to pothole the gas transmission facility at regular intervals for all parallel bore installations.

For bore paths that cross gas transmission pipelines perpendicularly, the pipeline must be potholed a minimum of 2 feet in the horizontal direction of the bore path and a minimum of 24 inches in the vertical direction from the bottom of the pipe with minimum clearances measured from the edge of the pipe in both directions. Standby personnel must watch the locator trace (and every ream pass) the path of the bore as it approaches the pipeline and visually monitor the pothole (with the exposed transmission pipe) as the bore traverses the pipeline to ensure adequate clearance with the pipeline. The pothole width must account for the inaccuracy of the locating equipment.

7. Substructures: All utility crossings of a gas pipeline should be made as close to perpendicular as feasible (90° +/- 15°). All utility lines crossing the gas pipeline must have a minimum of 24 inches of separation from the gas pipeline. Parallel utilities, pole bases, water line 'kicker blocks', storm drain inlets, water meters, valves, back pressure devices or other utility substructures are not allowed in the PG&E gas pipeline easement.

If previously retired PG&E facilities are in conflict with proposed substructures, PG&E must verify they are safe prior to removal. This includes verification testing of the contents of the facilities, as well as environmental testing of the coating and internal surfaces. Timelines for PG&E completion of this verification will vary depending on the type and location of facilities in conflict.

8. Structures: No structures are to be built within the PG&E gas pipeline easement. This includes buildings, retaining walls, fences, decks, patios, carports, septic tanks, storage sheds, tanks, loading ramps, or any structure that could limit PG&E's ability to access its facilities.

9. Fencing: Permanent fencing is not allowed within PG&E easements except for perpendicular crossings which must include a 16 foot wide gate for vehicular access. Gates will be secured with PG&E corporation locks.

10. Landscaping: Landscaping must be designed to allow PG&E to access the pipeline for maintenance and not interfere with pipeline coatings or other cathodic protection systems. No trees, shrubs, brush, vines, and other vegetation may be planted within the easement area. Only those plants, ground covers, grasses, flowers, and low-growing plants that grow unsupported to a maximum of four feet (4') in height at maturity may be planted within the easement area.

11. Cathodic Protection: PG&E pipelines are protected from corrosion with an "Impressed Current" cathodic protection system. Any proposed facilities, such as metal conduit, pipes, service lines, ground rods, anodes, wires, etc. that might affect the pipeline cathodic protection system must be reviewed and approved by PG&E Corrosion Engineering.

12. Pipeline Marker Signs: PG&E needs to maintain pipeline marker signs for gas transmission pipelines in order to ensure public awareness of the presence of the pipelines. With prior written approval from PG&E Pipeline Services, an existing PG&E pipeline marker sign that is in direct conflict with proposed developments may be temporarily relocated to accommodate construction work. The pipeline marker must be moved back once construction is complete.

13. PG&E is also the provider of distribution facilities throughout many of the areas within the state of California. Therefore, any plans that impact PG&E's facilities must be reviewed and approved by PG&E to ensure that no impact occurs which may endanger the safe operation of its facilities.

Attachment 2 – Electric Facilities

It is PG&E's policy to permit certain uses on a case by case basis within its electric transmission fee strip(s) and/or easement(s) provided such uses and manner in which they are exercised, will not interfere with PG&E's rights or endanger its facilities. Some examples/restrictions are as follows:

1. Buildings and Other Structures: No buildings or other structures including the foot print and eave of any buildings, swimming pools, wells or similar structures will be permitted within fee strip(s) and/or easement(s) areas. PG&E's transmission easement shall be designated on subdivision/parcel maps as "**RESTRICTED USE AREA – NO BUILDING.**"

2. Grading: Cuts, trenches or excavations may not be made within 25 feet of our towers. Developers must submit grading plans and site development plans (including geotechnical reports if applicable), signed and dated, for PG&E's review. PG&E engineers must review grade changes in the vicinity of our towers. No fills will be allowed which would impair ground-to-conductor clearances. Towers shall not be left on mounds without adequate road access to base of tower or structure.

3. Fences: Walls, fences, and other structures must be installed at locations that do not affect the safe operation of PG&'s facilities. Heavy equipment access to our facilities must be maintained at all times. Metal fences are to be grounded to PG&E specifications. No wall, fence or other like structure is to be installed within 10 feet of tower footings and unrestricted access must be maintained from a tower structure to the nearest street. Walls, fences and other structures proposed along or within the fee strip(s) and/or easement(s) will require PG&E review; submit plans to PG&E Centralized Review Team for review and comment.

4. Landscaping: Vegetation may be allowed; subject to review of plans. On overhead electric transmission fee strip(s) and/or easement(s), trees and shrubs are limited to those varieties that do not exceed 10 feet in height at maturity. PG&E must have access to its facilities at all times, including access by heavy equipment. No planting is to occur within the footprint of the tower legs. Greenbelts are encouraged.

5. Reservoirs, Sumps, Drainage Basins, and Ponds: Prohibited within PG&E's fee strip(s) and/or easement(s) for electric transmission lines.

6. Automobile Parking: Short term parking of movable passenger vehicles and light trucks (pickups, vans, etc.) is allowed. The lighting within these parking areas will need to be reviewed by PG&E; approval will be on a case by case basis. Heavy equipment access to PG&E facilities is to be maintained at all times. Parking is to clear PG&E structures by at least 10 feet. Protection of PG&E facilities from vehicular traffic is to be provided at developer's expense AND to PG&E specifications. Blocked-up vehicles are not allowed. Carports, canopies, or awnings are not allowed.

7. Storage of Flammable, Explosive or Corrosive Materials: There shall be no storage of fuel or combustibles and no fueling of vehicles within PG&E's easement. No trash bins or incinerators are allowed.

8. Streets and Roads: Access to facilities must be maintained at all times. Street lights may be allowed in the fee strip(s) and/or easement(s) but in all cases must be reviewed by PG&E for proper clearance. Roads and utilities should cross the transmission easement as nearly at right angles as possible. Road intersections will not be allowed within the transmission easement.

9. Pipelines: Pipelines may be allowed provided crossings are held to a minimum and to be as nearly perpendicular as possible. Pipelines within 25 feet of PG&E structures require review by PG&E. Sprinklers systems may be allowed; subject to review. Leach fields and septic tanks are not allowed. Construction plans must be submitted to PG&E for review and approval prior to the commencement of any construction.

10. Signs: Signs are not allowed except in rare cases subject to individual review by PG&E.

11. Recreation Areas: Playgrounds, parks, tennis courts, basketball courts, barbecue and light trucks (pickups, vans, etc.) may be allowed; subject to review of plans. Heavy equipment access to PG&E facilities is to be maintained at all times. Parking is to clear PG&E structures by at least 10 feet. Protection of PG&E facilities from vehicular traffic is to be provided at developer's expense AND to PG&E specifications.

12. Construction Activity: Since construction activity will take place near PG&E's overhead electric lines, please be advised it is the contractor's responsibility to be aware of, and observe the minimum clearances for both workers and equipment operating near high voltage electric lines set out in the High-Voltage Electrical Safety Orders of the California Division of Industrial Safety (https://www.dir.ca.gov/Title8/sb5g2.html), as well as any other safety regulations. Contractors shall comply with California Public Utilities Commission General Order 95 (http://www.cpuc.ca.gov/gos/GO95/go_95_startup_page.html) and all other safety rules. No construction may occur within 25 feet of PG&E's towers. All excavation activities may only commence after 811 protocols has been followed.

Contractor shall ensure the protection of PG&E's towers and poles from vehicular damage by (installing protective barriers) Plans for protection barriers must be approved by PG&E prior to construction.

13. PG&E is also the owner of distribution facilities throughout many of the areas within the state of California. Therefore, any plans that impact PG&E's facilities must be reviewed and approved by PG&E to ensure that no impact occurs that may endanger the safe and reliable operation of its facilities.

S J C O G, Inc.

555 East Weber Avenue • Stockton, CA 95202 • (209) 235-0574 • Email: boyd@sjcog.org

San Joaquin County Multi-Species Habitat Conservation & Open Space Plan (SJMSCP)

SJMSCP RESPONSE TO LOCAL JURISDICTION (RTLJ)
ADVISORY AGENCY NOTICE TO SJCOG, Inc.

To: Rick Caguiat, City of Lathrop, Community Development Department

From: Laurel Boyd, SJCOG, Inc. Phone: (209) 235-0574 Email: boyd@sjcog.org

Date: March 27, 2024

Local Jurisdiction Project Title: Notice of Preparation of an Environmental Impact Report for the Mossdale Landing West Specific Plan

Assessor Parcel Number(s): 191-190-010, 72, 191-610-020, 22, 191-620-59, 191-340-030

Local Jurisdiction Project Number: N/A

Total Acres to be converted from Open Space Use: Unknown

Habitat Types to be Disturbed: Agricultural Habitat Land

Species Impact Findings: Findings to be determined by SJMSCP biologist.

Dear Mr. Caguiat:

SJCOG, Inc. has reviewed the project referral for the Notice of Preparation of an Environmental Impact Report for the Mossdale Landing West Specific Plan. This project consists of the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements over five phases. The Specific Plan provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units per acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the analysis is conservative as the number of units constructed at buildout would likely be closer to 829. The Specific Plan provides the approximate acreages:

- Approximately 152.4 acres of Low-Density Residential;
- Approximately 16.5 acres of Public designated uses that are made up of:
    - Approximately 5.3 acres of linear park;
    - Approximately 6.2 acres of neighborhood community park;
    - Approximately 2.0 acres of parkland dedication south of River Islands Parkway;
    - Approximately 2.5 acres of other open space (including landscaped entries); and
    - Approximately 1.4 acres of levee slope easement.

The remainder of 38.2 acres will be undeveloped land. The project site is located west of Interstate 5 and south of Lathrop Road, Lathrop (APN: 191-190-010, 72, 191-610-020, 22, 191-620-59, 191-340-030).

The City of Lathrop is a signatory to San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). Participation in the SJMSCP satisfies requirements of both the state and federal endangered species acts, and ensures that the impacts are mitigated below a level of significance in compliance with the California Environmental Quality Act (CEQA). The LOCAL JURISDICTION retains responsibility for ensuring that the appropriate Incidental Take Minimization Measure are properly implemented and monitored and that appropriate fees are paid in compliance with the SJMSCP. Although participation in the SJMSCP is voluntary, Local Jurisdiction/Lead Agencies should be aware that if project applicants choose against participating in the SJMSCP, they will be required to provide alternative mitigation in an amount and kind equal to that provided in the SJMSCP.

This Project is subject to the SJMSCP. This can be up to a 30 day process and it is recommended that the project applicant contact SJMSCP staff as early as possible. It is also recommended that the project applicant obtain an information package. http://www.sjcog.org

Please contact SJMSCP staff regarding completing the following steps to satisfy SJMSCP requirements:

- Schedule a SJMSCP Biologist to perform a pre-construction survey ***prior to any ground disturbance***
- SJMSCP Incidental take Minimization Measures and mitigation requirement:

1. Incidental Take Minimization Measures (ITMMs) will be issued to the project and must be signed by the project applicant prior to any ground disturbance but no later than six (6) months from receipt of the ITMMs. If ITMMs are not signed within six months, the applicant must reapply for SJMSCP Coverage. Upon receipt of signed ITMMs from project applicant, SJCOG, Inc. staff will sign the ITMMs. This is the effective date of the ITMMs.
2. Under no circumstance shall ground disturbance occur without compliance and satisfaction of the ITMMs.
3. Upon issuance of fully executed ITMMs and prior to any ground disturbance, the project applicant must:
   a. Post a bond for payment of the applicable SJMSCP fee covering the entirety of the project acreage being covered (the bond should be valid for no longer than a 6 month period); or
   b. Pay the appropriate SJMSCP fee for the entirety of the project acreage being covered; or
   c. Dedicate land in-lieu of fees, either as conservation easements or fee title; or
   d. Purchase approved mitigation bank credits.
4. Within 6 months from the effective date of the ITMMs or issuance of a building permit, whichever occurs first, the project applicant must:
   a. Pay the appropriate SJMSCP for the entirety of the project acreage being covered; or
   b. Dedicate land in-lieu of fees, either as conservation easements or fee title; or
   c. Purchase approved mitigation bank credits.

Failure to satisfy the obligations of the mitigation fee shall subject the bond to be called.

- Receive your Certificate of Payment and release the required permit

It should be noted that if this project has any potential impacts to waters of the United States [pursuant to Section 404 Clean Water Act], it would require the project to seek voluntary coverage through the unmapped process under the SJMSCP which could take up to 90 days. It may be prudent to obtain a preliminary wetlands map from a qualified consultant. If waters of the United States are confirmed on the project site, the Corps and the Regional Water Quality Control Board (RWQCB) would have regulatory authority over those mapped areas [pursuant to Section 404 and 401 of the Clean Water Act respectively] and permits would be required from each of these resource agencies prior to grading the project site.

If you have any questions, please call (209) 235-0574.

S J C O G, Inc.

San Joaquin County Multi-Species Habitat Conservation & Open Space Plan

555 East Weber Avenue ● Stockton, CA 95202 ● (209) 235-0600 ● FAX (209) 235-0438

SJMSCP HOLD

TO: Local Jurisdiction: Community Development Department, Planning Department, Building Department, Engineering Department, Survey Department, Transportation Department, Other: ___________

FROM: Laurel Boyd, SJCOG, Inc.

DO NOT AUTHORIZE SITE DISTURBANCE
DO NOT ISSUE A BUILDING PERMIT
DO NOT ISSUE __________ FOR THIS PROJECT

The landowner/developer for this site has requested coverage pursuant to the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). In accordance with that agreement, the Applicant has agreed to:

1) SJMSCP Incidental Take Minimization Measures and mitigation requirement:

1. Incidental Take Minimization Measures (ITMMs) will be issued to the project and must be signed by the project applicant prior to any ground disturbance but no later than six (6) months from receipt of the ITMMs. If ITMMs are not signed within six months, the applicant must reapply for SJMSCP Coverage. Upon receipt of signed ITMMs from project applicant, SJCOG, Inc. staff will sign the ITMMs. This is the effective date of the ITMMs.
2. Under no circumstance shall ground disturbance occur without compliance and satisfaction of the ITMMs.
3. Upon issuance of fully executed ITMMs and prior to any ground disturbance, the project applicant must:
   a. Post a bond for payment of the applicable SJMSCP fee covering the entirety of the project acreage being covered (the bond should be valid for no longer than a 6 month period); or
   b. Pay the appropriate SJMSCP fee for the entirety of the project acreage being covered; or
   c. Dedicate land in-lieu of fees, either as conservation easements or fee title; or
   d. Purchase approved mitigation bank credits.
4. Within 6 months from the effective date of the ITMMs or issuance of a building permit, whichever occurs first, the project applicant must:
   a. Pay the appropriate SJMSCP for the entirety of the project acreage being covered; or
   b. Dedicate land in-lieu of fees, either as conservation easements or fee title; or
   c. Purchase approved mitigation bank credits.

   Failure to satisfy the obligations of the mitigation fee shall subject the bond to be called.

Project Title: NOP of an EIR for the Mossdale Landing West Specific Plan

Assessor Parcel #s: 191-190-010, 72, 191-610-020, 22, 191-620-59, 191-340-030

T _______, R______, Section(s): _____

Local Jurisdiction Contact: Rick Caguiat

The LOCAL JURISDICTION retains responsibility for ensuring that the appropriate Incidental Take Minimization Measures are properly implemented and monitored and that appropriate fees are paid in compliance with the SJMSCP.

Environmental Health Department
Jasjit Kang, REHS, Director
Muniappa Naidu, REHS, Assistant Director
PROGRAM COORDINATORS
Jeff Carruesco, REHS, RDI
Willy Ng, REHS
Steven Shih, REHS
Elena Manzo, REHS
Natalia Subbotnikova, REHS

April 8, 2024

To: City of Lathrop Development Services Department

From: Aldara Salinas; (209) 616-3019
Environmental Health Specialist

RE: **Mossdale Landing West Specific Plan- Initial Study, Referral, SU0016176**

The San Joaquin County Environmental Health Department (EHD) has reviewed the Notice of Preparation and Initial Study and has no comments at this time.

April 24, 2024

Rick Caguiat
City of Lathrop
Community Development Department
390 Towne Centre Drive
Lathrop, CA 95330

Project: Notice of Preparation for the Mossdale Landing West Specific Plan

District CEQA Reference No: 20240376

Dear Mr. Caguiat:

The San Joaquin Valley Air Pollution Control District (District) has reviewed the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) from the City of Lathrop (City) for the Mossdale Landing West Specific Plan. Per the NOP, the project consists of 912 residential units with associated park, circulation, and utility improvements over five phases (Project). The Project is located in Lathrop, CA, near Barbara Terry Boulevard to the north and River Islands Parkway to the southeast.

The District offers the following comments at this time regarding the Project:

1) Project Related Emissions

At the federal level under the National Ambient Air Quality Standards (NAAQS), the District is designated as extreme nonattainment for the 8-hour ozone standards and serious nonattainment for the particulate matter less than 2.5 microns in size (PM2.5) standards. At the state level under California Ambient Air Quality Standards (CAAQS), the District is designated as nonattainment for the 8-hour ozone, PM10, and PM2.5 standards.

The District's initial review of the Project concludes that emissions resulting from construction and operation of the Project may exceed any of the following significance thresholds as identified in the District's Guidance for Assessing and Mitigating Air Quality Impacts: https://ww2.valleyair.org/media/g4nl3p0g/gamaqi.pdf. The District recommends that a more detailed preliminary review of the Project be conducted for the Project's construction and operational emissions.

1a) Construction Emissions

The District recommends, to reduce impacts from construction-related diesel exhaust emissions, the Project should utilize the cleanest available off-road construction equipment.

1b) Operational Emissions

Operational (ongoing) air emissions from mobile sources and stationary sources should be analyzed separately. For reference, the District's significance thresholds are identified in the District's Guidance for Assessing and Mitigating Air Quality Impacts: https://ww2.valleyair.org/media/g4nl3p0g/gamaqi.pdf.

Recommended Mitigation Measure: At a minimum, project related impacts on air quality should be reduced to levels below the District's significance thresholds through incorporation of design elements such as the use of cleaner Heavy Heavy-Duty (HHD) trucks and vehicles, measures that reduce Vehicle Miles Traveled (VMTs), and measures that increase energy efficiency. More information on transportation mitigation measures can be found at: https://ww2.valleyair.org/media/ob0pweru/clean-air-measures.pdf

1c) Recommended Model for Quantifying Air Emissions

Project-related criteria pollutant emissions from construction and operational sources should be identified and quantified. Emissions analysis should be performed using the California Emission Estimator Model (CalEEMod), which uses the most recent CARB-approved version of relevant emissions models and emission factors. CalEEMod is available to the public and can be downloaded from the CalEEMod website at: www.caleemod.com.

2) Health Risk Screening/Assessment

The City should evaluate the risk associated with the Project for sensitive receptors (residences, businesses, hospitals, day-care facilities, health care facilities, etc.) in the area and mitigate any potentially significant risk to help limit exposure of sensitive receptors to emissions.

To determine potential health impacts on surrounding receptors (residences, businesses, hospitals, day-care facilities, health care facilities, etc.) a Prioritization and/or a Health Risk Assessment (HRA) should be performed for the Project. These health risk determinations should quantify and characterize potential Toxic Air Contaminants (TACs) identified by the Office of Environmental Health Hazard Assessment/California Air Resources Board (OEHHA/CARB) that pose a present or potential hazard to human health.

Health risk analyses should include all potential air emissions from the project, which include emissions from construction of the project, including multi-year construction, as well as ongoing operational activities of the project. Note, two common sources of TACs can be attributed to diesel exhaust emitted from heavy-duty off-road earth moving equipment during construction, and from ongoing operation of heavy-duty on-road trucks.

Prioritization (Screening Health Risk Assessment):
A "Prioritization" is the recommended method for a conservative screening-level health risk assessment. The Prioritization should be performed using the California Air Pollution Control Officers Association's (CAPCOA) methodology. Please contact the District for assistance with performing a Prioritization analysis.

The District recommends that a more refined analysis, in the form of an HRA, be performed for any project resulting in a Prioritization score of 10 or greater. This is because the prioritization results are a conservative health risk representation, while the detailed HRA provides a more accurate health risk evaluation.

Health Risk Assessment:
Prior to performing an HRA, it is strongly recommended that land use agencies/ project proponents develop and submit for District review a health risk modeling protocol that outlines the sources and methodologies that will be used to perform the HRA.

A development project would be considered to have a potentially significant health risk if the HRA demonstrates that the health impacts would exceed the District's established risk thresholds, which can be found here:
https://ww2.valleyair.org/permitting/ceqa/.

A project with a significant health risk would trigger all feasible mitigation measures. The District strongly recommends that development projects that result in a significant health risk not be approved by the land use agency.

The District is available to review HRA protocols and analyses. For HRA submittals please provide the following information electronically to the District for review:

- HRA (AERMOD) modeling files
- HARP2 files
- Summary of emissions source locations, emissions rates, and emission factor calculations and methodologies.

For assistance, please contact the District's Technical Services Department by:

- E-Mailing inquiries to: hramodeler@valleyair.org
- Calling (559) 230-5900

Recommended Measure: Development projects resulting in TAC emissions should be located an adequate distance from residential areas and other sensitive receptors to prevent the creation of a significant health risk in accordance to CARB's Air Quality and Land Use Handbook: A Community Health Perspective located at https://ww2.arb.ca.gov/our-work/programs/resource-center/strategy-development/land-use-resources.

3) Ambient Air Quality Analysis

An Ambient Air Quality Analysis (AAQA) uses air dispersion modeling to determine if emissions increases from a project will cause or contribute to a violation of State or National Ambient Air Quality Standards. The District recommends an AAQA be performed for the Project if emissions exceed 100 pounds per day of any pollutant.

An AAQA uses air dispersion modeling to determine if emission increase from a project will cause or contribute to a violation of State or National Ambien Air Quality Standards. An acceptable analysis would include emissions from both project-specific permitted and non-permitted equipment and activities. The District recommends consultation with District staff to determine the appropriate model and input data to use in the analysis.

Specific information for assessing significance, including screening tools and modeling guidance, is available online at the District's website: https://ww2.valleyair.org/permitting/ceqa/.

4) Voluntary Emission Reduction Agreement

Criteria pollutant emissions may result in emissions exceeding the District's significance thresholds, potentially resulting in a significant impact on air quality. When a project is expected to have a significant impact, the District recommends the DEIR also include a discussion on the feasibility of implementing a Voluntary Emission Reduction Agreement (VERA) for this Project.

A VERA is a mitigation measure by which the project proponent provides pound-for-pound mitigation of emissions increases through a process that develops, funds, and implements emission reduction projects, with the District serving a role of administrator of the emissions reduction projects and verifier of the successful mitigation effort. To implement a VERA, the project proponent and the District enter into a contractual agreement in which the project proponent agrees to mitigate project specific emissions by providing funds for the District's incentives programs.

The funds are disbursed by the District in the form of grants for projects that achieve emission reductions. Thus, project-related impacts on air quality can be mitigated. Types of emission reduction projects that have been funded in the past include electrification of stationary internal combustion engines (such as agricultural irrigation pumps), replacing old heavy-duty trucks with new, cleaner, more efficient heavy-duty trucks, and replacement of agricultural equipment with the latest generation technologies.

In implementing a VERA, the District verifies the actual emission reductions that have been achieved as a result of completed grant contracts, monitors the emission reduction projects, and ensures the enforceability of achieved reductions. After the project is mitigated, the District certifies to the Lead Agency that the mitigation is completed, providing the Lead Agency with an enforceable mitigation measure demonstrating that project-related emissions have been mitigated.

To assist the Lead Agency and project proponent in ensuring that the environmental document is compliant with CEQA, the District recommends the environmental document includes an assessment of the feasibility of implementing a VERA.

5) Vegetative Barriers and Urban Greening

There are residential units located northeast and southeast of the Project. The District suggests the City consider the feasibility of incorporating vegetative barriers and urban greening as a measure to further reduce air pollution exposure on sensitive receptors (e.g., residential units).

While various emission control techniques and programs exist to reduce air quality emissions from mobile and stationary sources, vegetative barriers have been shown to be an additional measure to potentially reduce a population’s exposure to air pollution through the interception of airborne particles and the update of gaseous pollutants. Examples of vegetative barriers include, but are not limited to the following: trees, bushes, shrubs, or a mix of these. Generally, a higher and thicker vegetative barrier with full coverage will result in greater reductions in downwind pollutant concentrations. In the same manner, urban greening is also a way to help improve air quality and public health in addition to enhancing the overall beautification of a community with drought tolerant, low-maintenance greenery.

6) Clean Lawn and Garden Equipment in the Community

Since the Project consists of residential development, gas-powered lawn and garden equipment have the potential to result in an increase of NOx and PM2.5 emissions. Utilizing electric lawn care equipment can provide residents with immediate economic, environmental, and health benefits. The District recommends the Project proponent consider the District’s Clean Green Yard Machines (CGYM) program which provides incentive funding for replacement of existing gas powered lawn and garden equipment. More information on the District CGYM program and funding can be found at: https://ww2.valleyair.org/grants/clean-green-yard-machines-residential/ and https://ww2.valleyair.org/grants/zero-emission-landscaping-equipment-voucher-program/.

7) On-Site Solar Deployment

It is the policy of the State of California that renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers by December 31, 2045. While various emission control techniques and programs exist to reduce air quality emissions from mobile and stationary sources, the production of solar energy is contributing to improving air quality and public health. The District suggests that the City consider incorporating solar power systems as an emission reduction strategy for the Project.

8) Electric Infrastructure

To support and accelerate the installation of electric vehicle charging equipment and development of required infrastructure, the District offers incentives to public agencies, businesses, and property owners of multi-unit dwellings to install electric charging infrastructure (Level 2 and 3 chargers). The purpose of the District's Charge Up! Incentive program is to promote clean air alternative-fuel technologies and the use of low or zero-emission vehicles. The District recommends that the City and project proponents install electric vehicle chargers at project sites, and at strategic locations.

Please visit https://ww2.valleyair.org/grants/charge-up for more information.

9) District Rules and Regulations

The District issues permits for many types of air pollution sources, and regulates some activities that do not require permits. A project subject to District rules and regulations would reduce its impacts on air quality through compliance with the District's regulatory framework. In general, a regulation is a collection of individual rules, each of which deals with a specific topic. As an example, Regulation II (Permits) includes District Rule 2010 (Permits Required), Rule 2201 (New and Modified Stationary Source Review), Rule 2520 (Federally Mandated Operating Permits), and several other rules pertaining to District permitting requirements and processes.

The list of rules below is neither exhaustive nor exclusive. Current District rules can be found online at: https://ww2.valleyair.org/rules-and-planning/current-district-rules-and-regulations. To identify other District rules or regulations that apply to future projects, or to obtain information about District permit requirements, the project proponents are strongly encouraged to contact the District's Small Business Assistance (SBA) Office at (209) 557-6446.

9a) District Rules 2010 and 2201 - Air Quality Permitting for Stationary Sources

Stationary Source emissions include any building, structure, facility, or installation which emits or may emit any affected pollutant directly or as a fugitive emission. District Rule 2010 (Permits Required) requires operators of emission sources to obtain an Authority to Construct (ATC) and Permit to Operate (PTO) from the District. District Rule 2201 (New and Modified Stationary Source Review) requires that new and modified stationary sources of emissions mitigate their emissions using Best Available Control Technology (BACT).

This Project may be subject to District Rule 2010 (Permits Required) and Rule 2201 (New and Modified Stationary Source Review) and may require District permits. Prior to construction, the Project proponent should submit to the District an application for an ATC. For further information or assistance, the project proponent may contact the District's SBA Office at (209) 557-6446.

9b) District Rule 9510 - Indirect Source Review (ISR)

The Project is subject to District Rule 9510 because it will receive a project-level discretionary approval from a public agency and will equal or exceed 50 dwelling units of residential development.

The purpose of District Rule 9510 is to reduce the growth in both NOx and PM emissions associated with development and transportation projects from mobile and area sources; specifically, the emissions associated with the construction and subsequent operation of development projects. The ISR Rule requires developers to mitigate their NOx and PM emissions by incorporating clean air design elements into their projects. Should the proposed development project clean air design elements be insufficient to meet the required emission reductions, developers must pay a fee that ultimately funds incentive projects to achieve off-site emissions reductions.

Per Section 5.0 of the ISR Rule, an Air Impact Assessment (AIA) application is required to be submitted no later than applying for project-level approval from a public agency. As of the date of this letter, the District has not received an AIA application for this Project. Please immediately submit an AIA application to the

District to comply with District Rule 9510 so that proper mitigation and clean air design under ISR can be incorporated into the Project's design. One AIA application should be submitted for the entire Project.

Information about how to comply with District Rule 9510 can be found online at: https://ww2.valleyair.org/permitting/indirect-source-review-rule-overview

The AIA application form can be found online at: https://ww2.valleyair.org/permitting/indirect-source-review-rule-overview/forms-and-applications/

9c) District Rule 4002 (National Emissions Standards for Hazardous Air Pollutants)

In the event an existing building will be renovated, partially demolished or removed, the Project may be subject to District Rule 4002. This rule requires a thorough inspection for asbestos to be conducted before any regulated facility is demolished or renovated.

Information on how to comply with District Rule 4002 can be found online at: https://ww2.valleyair.org/compliance/demolition-renovation/

9d) District Rule 4601 (Architectural Coatings)

The Project will be subject to District Rule 4601 since it is expected to utilize architectural coatings. Architectural coatings are paints, varnishes, sealers, or stains that are applied to structures, portable buildings, pavements or curbs. The purpose of this rule is to limit VOC emissions from architectural coatings. In addition, this rule specifies architectural coatings storage, cleanup and labeling requirements. Additional information on how to comply with District Rule 4601 requirements can be found online at: https://ww2.valleyair.org/media/tkgjeusd/rule-4601.pdf

9e) District Regulation VIII (Fugitive PM10 Prohibitions)

The project proponent may be required to submit a Construction Notification Form or submit and receive approval of a Dust Control Plan prior to commencing any earthmoving activities as described in Regulation VIII, specifically Rule 8021 – *Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities.*

Should the project result in at least 1-acre in size, the project proponent shall provide written notification to the District at least 48 hours prior to the project proponents intent to commence any earthmoving activities pursuant to District Rule 8021 (Construction, Demolition, Excavation, Extraction, and Other

Earthmoving Activities). Also, should the project result in the disturbance of 5-acres or more, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials, the project proponent shall submit to the District a Dust Control Plan pursuant to District Rule 8021 (Construction, Demolition, Excavation, Extraction, and Other Earthmoving Activities). For additional information regarding the written notification or Dust Control Plan requirements, please contact District Compliance staff at (559) 230-5950. The application for both the Construction Notification and Dust Control Plan can be found online at: https://ww2.valleyair.org/media/fm3jrbsq/dcp-form.docx

Information about District Regulation VIII can be found online at: https://ww2.valleyair.org/dustcontrol

9f) District Rule 4901 - Wood Burning Fireplaces and Heaters

The purpose of this rule is to limit emissions of carbon monoxide and particulate matter from wood burning fireplaces, wood burning heaters, and outdoor wood burning devices.
This rule establishes limitations on the installation of new wood burning fireplaces and wood burning heaters. Specifically, at elevations below 3,000 feet in areas with natural gas service, no person shall install a wood burning fireplace, low mass fireplace, masonry heater, or wood burning heater.

Information about District Rule 4901 can be found online at: https://ww2.valleyair.org/compliance/residential-wood-smoke-reduction-program/

9g) Other District Rules and Regulations

The Project may also be subject to the following District rules: Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations).

If you have any questions or require further information, please contact Jacob Torrez by e-mail at Jacob.torrez@valleyair.org or by phone at (559) 230-6558.

Sincerely,

Tom Jordan
Director of Policy and Government Affairs

For: Mark Montelongo
Program Manager

APPENDIX B

Air Quality, Greenhouse Gas, and Energy Appendices

Mossdale West Specific Plan Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Mossdale West Specific Plan
Construction Start Date	5/1/2025
Operational Year	2040
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.40
Precipitation (days)	9.00
Location	37.81082917032258, -121.31636850725472
County	San Joaquin
City	Lathrop
Air District	San Joaquin Valley APCD
Air Basin	San Joaquin Valley
TAZ	2103
EDFZ	4
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.26

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	912	Dwelling Unit	147	1,778,400	10,682,126	0.00	2,946	—

City Park	16.5	Acre	16.5	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	37.5	37.1	31.7	34.2	0.06	1.37	19.8	21.2	1.26	10.1	11.4	—	8,809	8,809	0.28	0.56	18.9	9,000
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	38.6	38.0	29.8	42.3	0.06	1.23	9.37	10.6	1.14	3.69	4.83	—	10,224	10,224	0.32	0.58	0.56	10,406
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	26.8	26.4	13.5	22.5	0.03	0.55	5.33	5.87	0.50	2.38	2.88	—	6,205	6,205	0.17	0.41	5.85	6,336
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.88	4.83	2.47	4.11	0.01	0.10	0.97	1.07	0.09	0.43	0.53	—	1,027	1,027	0.03	0.07	0.97	1,049

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2025	4.02	3.38	31.7	31.1	0.06	1.37	19.8	21.2	1.26	10.1	11.4	—	6,784	6,784	0.28	0.06	0.69	6,810
2026	37.5	37.1	15.0	34.2	0.04	0.44	4.05	4.49	0.41	0.98	1.39	—	8,809	8,809	0.22	0.56	18.9	9,000
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	38.6	38.0	29.8	42.3	0.06	1.23	9.37	10.6	1.14	3.69	4.83	—	10,224	10,224	0.32	0.58	0.56	10,406
2026	38.4	37.8	22.6	40.8	0.06	0.76	4.18	4.94	0.70	1.01	1.71	—	10,102	10,102	0.31	0.58	0.50	10,284
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	8.00	7.70	13.5	16.7	0.03	0.55	5.33	5.87	0.50	2.38	2.88	—	3,653	3,653	0.13	0.12	1.73	3,694
2026	26.8	26.4	11.3	22.5	0.03	0.33	2.89	3.22	0.31	0.70	1.01	—	6,205	6,205	0.17	0.41	5.85	6,336
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.46	1.41	2.47	3.04	< 0.005	0.10	0.97	1.07	0.09	0.43	0.53	—	605	605	0.02	0.02	0.29	612
2026	4.88	4.83	2.07	4.11	0.01	0.06	0.53	0.59	0.06	0.13	0.18	—	1,027	1,027	0.03	0.07	0.97	1,049

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	49.5	47.2	25.4	269	0.66	0.87	64.3	65.2	0.85	16.3	17.2	506	76,011	76,517	53.9	2.74	46.7	78,730
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	43.8	41.7	27.7	181	0.61	0.85	64.3	65.1	0.83	16.3	17.2	506	71,132	71,639	54.1	2.94	13.6	73,880
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	45.6	43.4	26.2	206	0.61	0.85	62.4	63.2	0.83	15.9	16.7	506	70,900	71,407	54.0	2.79	27.1	73,614
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	8.32	7.93	4.79	37.6	0.11	0.16	11.4	11.5	0.15	2.89	3.05	83.9	11,738	11,822	8.94	0.46	4.48	12,188

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	21.9	20.2	18.2	214	0.62	0.31	64.3	64.6	0.29	16.3	16.6	—	62,779	62,779	1.63	2.46	34.0	63,588
Area	26.8	26.6	0.48	52.0	< 0.005	0.02	—	0.02	0.02	—	0.02	—	138	138	0.01	< 0.005	—	139
Energy	0.78	0.39	6.70	2.85	0.04	0.54	—	0.54	0.54	—	0.54	—	12,848	12,848	1.46	0.10	—	12,914
Water	—	—	—	—	—	—	—	—	—	—	—	71.1	246	317	7.33	0.18	—	553
Waste	—	—	—	—	—	—	—	—	—	—	—	435	0.00	435	43.5	0.00	—	1,523
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.7	12.7
Total	49.5	47.2	25.4	269	0.66	0.87	64.3	65.2	0.85	16.3	17.2	506	76,011	76,517	53.9	2.74	46.7	78,730
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	20.9	19.2	21.0	178	0.57	0.31	64.3	64.6	0.29	16.3	16.6	—	58,039	58,039	1.79	2.66	0.88	58,876
Area	22.1	22.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.78	0.39	6.70	2.85	0.04	0.54	—	0.54	0.54	—	0.54	—	12,848	12,848	1.46	0.10	—	12,914
Water	—	—	—	—	—	—	—	—	—	—	—	71.1	246	317	7.33	0.18	—	553
Waste	—	—	—	—	—	—	—	—	—	—	—	435	0.00	435	43.5	0.00	—	1,523
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.7	12.7
Total	43.8	41.7	27.7	181	0.61	0.85	64.3	65.1	0.83	16.3	17.2	506	71,132	71,639	54.1	2.94	13.6	73,880
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	20.4	18.7	19.3	178	0.57	0.30	62.4	62.7	0.28	15.9	16.1	—	57,739	57,739	1.67	2.51	14.3	58,542
Area	24.4	24.3	0.24	25.6	< 0.005	0.01	—	0.01	0.01	—	0.01	—	68.2	68.2	< 0.005	< 0.005	—	68.5
Energy	0.78	0.39	6.70	2.85	0.04	0.54	—	0.54	0.54	—	0.54	—	12,848	12,848	1.46	0.10	—	12,914

Water	—	—	—	—	—	—	—	—	—	—	—	71.1	246	317	7.33	0.18	—	553
Waste	—	—	—	—	—	—	—	—	—	—	—	435	0.00	435	43.5	0.00	—	1,523
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.7	12.7
Total	45.6	43.4	26.2	206	0.61	0.85	62.4	63.2	0.83	15.9	16.7	506	70,900	71,407	54.0	2.79	27.1	73,614
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.72	3.42	3.52	32.4	0.10	0.06	11.4	11.4	0.05	2.89	2.95	—	9,559	9,559	0.28	0.42	2.37	9,692
Area	4.46	4.43	0.04	4.68	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.3	11.3	< 0.005	< 0.005	—	11.3
Energy	0.14	0.07	1.22	0.52	0.01	0.10	—	0.10	0.10	—	0.10	—	2,127	2,127	0.24	0.02	—	2,138
Water	—	—	—	—	—	—	—	—	—	—	—	11.8	40.7	52.5	1.21	0.03	—	91.6
Waste	—	—	—	—	—	—	—	—	—	—	—	72.1	0.00	72.1	7.20	0.00	—	252
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.11	2.11
Total	8.32	7.93	4.79	37.6	0.11	0.16	11.4	11.5	0.15	2.89	3.05	83.9	11,738	11,822	8.94	0.46	4.48	12,188

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.66	0.55	5.29	5.04	0.01	0.23	—	0.23	0.21	—	0.21	—	885	885	0.04	0.01	—	888
Dust From Material Movement	—	—	—	—	—	—	3.29	3.29	—	1.69	1.69	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.97	0.92	< 0.005	0.04	—	0.04	0.04	—	0.04	—	147	147	0.01	< 0.005	—	147
Dust From Material Movement	—	—	—	—	—	—	0.60	0.60	—	0.31	0.31	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.05	0.91	0.00	0.00	0.15	0.15	0.00	0.03	0.03	—	162	162	0.01	0.01	0.60	165
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.12	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	25.1	25.1	< 0.005	< 0.005	0.04	25.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.15	4.15	< 0.005	< 0.005	0.01	4.21
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	9.20	9.20	—	3.65	3.65	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	9.20	9.20	—	3.65	3.65	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.52	0.44	4.07	3.88	0.01	0.17	—	0.17	0.16	—	0.16	—	904	904	0.04	0.01	—	907
Dust From Material Movement	—	—	—	—	—	—	1.26	1.26	—	0.50	0.50	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.08	0.74	0.71	< 0.005	0.03	—	0.03	0.03	—	0.03	—	150	150	0.01	< 0.005	—	150
Dust From Material Movement	—	—	—	—	—	—	0.23	0.23	—	0.09	0.09	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.06	1.04	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	185	185	0.01	0.01	0.69	188
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.08	0.83	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	167	167	< 0.005	0.01	0.02	169
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.12	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	23.5	23.5	< 0.005	< 0.005	0.04	23.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.89	3.89	< 0.005	< 0.005	0.01	3.94
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.24	0.20	1.84	2.30	< 0.005	0.08	—	0.08	0.07	—	0.07	—	422	422	0.02	< 0.005	—	424
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.04	0.34	0.42	< 0.005	0.01	—	0.01	0.01	—	0.01	—	69.9	69.9	< 0.005	< 0.005	—	70.2
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.39	1.26	1.24	13.6	0.00	0.00	2.76	2.76	0.00	0.65	0.65	—	2,744	2,744	0.08	0.12	0.29	2,781
Vendor	0.14	0.08	3.66	1.19	0.02	0.04	0.74	0.78	0.04	0.21	0.24	—	2,763	2,763	0.05	0.41	0.20	2,886
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.24	0.22	0.18	2.45	0.00	0.00	0.48	0.48	0.00	0.11	0.11	—	495	495	0.01	0.02	0.86	503
Vendor	0.03	0.02	0.63	0.21	< 0.005	0.01	0.13	0.14	0.01	0.04	0.04	—	486	486	0.01	0.07	0.58	509
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.03	0.45	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	82.0	82.0	< 0.005	< 0.005	0.14	83.2

Vendor	< 0.005	< 0.005	0.11	0.04	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	80.5	80.5	< 0.005	0.01	0.10	84.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.77	7.04	9.26	0.02	0.27	—	0.27	0.25	—	0.25	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.17	0.14	1.28	1.69	< 0.005	0.05	—	0.05	0.05	—	0.05	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.39	1.29	0.83	15.8	0.00	0.00	2.76	2.76	0.00	0.65	0.65	—	2,973	2,973	0.06	0.11	10.2	3,017
Vendor	0.14	0.09	3.28	1.10	0.02	0.04	0.74	0.78	0.04	0.21	0.24	—	2,710	2,710	0.05	0.41	6.66	2,840
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.31	1.19	1.04	12.5	0.00	0.00	2.76	2.76	0.00	0.65	0.65	—	2,688	2,688	0.07	0.12	0.26	2,724
Vendor	0.14	0.08	3.49	1.14	0.02	0.04	0.74	0.78	0.04	0.21	0.24	—	2,713	2,713	0.05	0.41	0.17	2,836
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.93	0.85	0.67	9.15	0.00	0.00	1.96	1.96	0.00	0.46	0.46	—	1,968	1,968	0.05	0.08	3.15	1,997
Vendor	0.10	0.06	2.44	0.80	0.01	0.03	0.53	0.56	0.03	0.15	0.17	—	1,937	1,937	0.04	0.29	2.06	2,027
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.16	0.12	1.67	0.00	0.00	0.36	0.36	0.00	0.08	0.08	—	326	326	0.01	0.01	0.52	331
Vendor	0.02	0.01	0.45	0.15	< 0.005	0.01	0.10	0.10	0.01	0.03	0.03	—	321	321	0.01	0.05	0.34	336
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.31	1.76	< 0.005	0.06	—	0.06	0.06	—	0.06	—	266	266	0.01	< 0.005	—	267
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.24	0.32	< 0.005	0.01	—	0.01	0.01	—	0.01	—	44.1	44.1	< 0.005	< 0.005	—	44.2
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.06	0.62	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	125	125	< 0.005	0.01	0.01	127
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.11	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	22.6	22.6	< 0.005	< 0.005	0.04	23.0
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.75	3.75	< 0.005	< 0.005	0.01	3.80
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.76	7.12	9.94	0.01	0.32	—	0.32	0.29	—	0.29	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.05	0.43	0.60	< 0.005	0.02	—	0.02	0.02	—	0.02	—	91.6	91.6	< 0.005	< 0.005	—	92.0
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.08	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.2	15.2	< 0.005	< 0.005	—	15.2
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.05	0.57	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	123	123	< 0.005	0.01	0.01	124
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.64	7.64	< 0.005	< 0.005	0.01	7.75
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.26	1.26	< 0.005	< 0.005	< 0.005	1.28
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	34.2	34.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.16	0.20	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	23.5	23.5	< 0.005	< 0.005	—	23.6
Architectural Coatings	6.03	6.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	3.89	3.89	< 0.005	< 0.005	—	3.91
Architectural Coatings	1.10	1.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.25	0.25	2.72	0.00	0.00	0.55	0.55	0.00	0.13	0.13	—	549	549	0.02	0.02	0.06	556
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.04	0.49	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	99.1	99.1	< 0.005	< 0.005	0.17	101
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.4	16.4	< 0.005	< 0.005	0.03	16.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	34.2	34.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	34.2	34.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.09	0.61	0.81	< 0.005	0.02	—	0.02	0.02	—	0.02	—	95.4	95.4	< 0.005	< 0.005	—	95.7

Architect Coatings	24.5	24.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.11	0.15	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.8	15.8	< 0.005	< 0.005	—	15.8
Architectural Coatings	4.46	4.46	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.28	0.26	0.17	3.16	0.00	0.00	0.55	0.55	0.00	0.13	0.13	—	595	595	0.01	0.02	2.04	603
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.26	0.24	0.21	2.50	0.00	0.00	0.55	0.55	0.00	0.13	0.13	—	538	538	0.01	0.02	0.05	545
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.19	0.17	0.13	1.83	0.00	0.00	0.39	0.39	0.00	0.09	0.09	—	394	394	0.01	0.02	0.63	399
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.03	0.03	0.02	0.33	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	65.2	65.2	< 0.005	< 0.005	0.10	66.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	21.8	20.2	18.2	214	0.61	0.31	64.1	64.4	0.29	16.3	16.6	—	62,551	62,551	1.63	2.46	33.8	63,357
City Park	0.09	0.08	0.07	0.79	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	—	228	228	0.01	0.01	0.12	231
Total	21.9	20.2	18.2	214	0.62	0.31	64.3	64.6	0.29	16.3	16.6	—	62,779	62,779	1.63	2.46	34.0	63,588
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	20.8	19.1	20.9	178	0.57	0.31	64.1	64.4	0.29	16.3	16.6	—	57,828	57,828	1.79	2.65	0.88	58,663
City Park	0.08	0.08	0.08	0.67	< 0.005	< 0.005	0.23	0.23	< 0.005	0.06	0.06	—	210	210	0.01	0.01	< 0.005	214
Total	20.9	19.2	21.0	178	0.57	0.31	64.3	64.6	0.29	16.3	16.6	—	58,039	58,039	1.79	2.66	0.88	58,876
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	3.71	3.41	3.52	32.3	0.10	0.05	11.4	11.4	0.05	2.89	2.94	—	9,541	9,541	0.28	0.41	2.37	9,673
City Park	0.01	0.01	0.01	0.06	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	18.6	18.6	< 0.005	< 0.005	< 0.005	18.9
Total	3.72	3.42	3.52	32.4	0.10	0.06	11.4	11.4	0.05	2.89	2.95	—	9,559	9,559	0.28	0.42	2.37	9,692

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	4,345	4,345	0.70	0.09	—	4,388
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	4,345	4,345	0.70	0.09	—	4,388
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	4,345	4,345	0.70	0.09	—	4,388
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	4,345	4,345	0.70	0.09	—	4,388
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	719	719	0.12	0.01	—	727
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	719	719	0.12	0.01	—	727

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.78	0.39	6.70	2.85	0.04	0.54	—	0.54	0.54	—	0.54	—	8,503	8,503	0.75	0.02	—	8,526
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.78	0.39	6.70	2.85	0.04	0.54	—	0.54	0.54	—	0.54	—	8,503	8,503	0.75	0.02	—	8,526
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.78	0.39	6.70	2.85	0.04	0.54	—	0.54	0.54	—	0.54	—	8,503	8,503	0.75	0.02	—	8,526
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.78	0.39	6.70	2.85	0.04	0.54	—	0.54	0.54	—	0.54	—	8,503	8,503	0.75	0.02	—	8,526
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.14	0.07	1.22	0.52	0.01	0.10	—	0.10	0.10	—	0.10	—	1,408	1,408	0.12	< 0.005	—	1,412

City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.14	0.07	1.22	0.52	0.01	0.10	—	0.10	0.10	—	0.10	—	1,408	1,408	0.12	< 0.005	—	1,412

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	19.0	19.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	3.05	3.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	4.74	4.49	0.48	52.0	< 0.005	0.02	—	0.02	0.02	—	0.02	—	138	138	0.01	< 0.005	—	139
Total	26.8	26.6	0.48	52.0	< 0.005	0.02	—	0.02	0.02	—	0.02	—	138	138	0.01	< 0.005	—	139
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	19.0	19.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	3.05	3.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	22.1	22.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	3.47	3.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.56	0.56	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.43	0.40	0.04	4.68	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.3	11.3	< 0.005	< 0.005	—	11.3
Total	4.46	4.43	0.04	4.68	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	11.3	11.3	< 0.005	< 0.005	—	11.3

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	71.1	246	317	7.33	0.18	—	553
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	71.1	246	317	7.33	0.18	—	553
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	71.1	246	317	7.33	0.18	—	553
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	71.1	246	317	7.33	0.18	—	553
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	11.8	40.7	52.5	1.21	0.03	—	91.6
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	11.8	40.7	52.5	1.21	0.03	—	91.6

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	435	0.00	435	43.4	0.00	—	1,521
City Park	—	—	—	—	—	—	—	—	—	—	—	0.76	0.00	0.76	0.08	0.00	—	2.68
Total	—	—	—	—	—	—	—	—	—	—	—	435	0.00	435	43.5	0.00	—	1,523
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	435	0.00	435	43.4	0.00	—	1,521
City Park	—	—	—	—	—	—	—	—	—	—	—	0.76	0.00	0.76	0.08	0.00	—	2.68
Total	—	—	—	—	—	—	—	—	—	—	—	435	0.00	435	43.5	0.00	—	1,523
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	72.0	0.00	72.0	7.19	0.00	—	252
City Park	—	—	—	—	—	—	—	—	—	—	—	0.13	0.00	0.13	0.01	0.00	—	0.44
Total	—	—	—	—	—	—	—	—	—	—	—	72.1	0.00	72.1	7.20	0.00	—	252

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.7	12.7
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.7	12.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.7	12.7
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.7	12.7
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.11	2.11
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.11	2.11

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	5/1/2025	7/24/2025	5.00	61.0	—
Grading	Grading	7/25/2025	10/2/2025	5.00	50.0	—
Building Construction	Building Construction	10/3/2025	12/31/2026	5.00	325	—
Paving	Paving	10/3/2025	1/31/2026	5.00	86.0	—
Architectural Coating	Architectural Coating	10/3/2025	12/31/2026	5.00	325	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41

Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.9	LDA,LDT1,LDT2
Site Preparation	Vendor	—	9.10	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.9	LDA,LDT1,LDT2
Grading	Vendor	—	9.10	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT

Building Construction	—	—	—	—
Building Construction	Worker	328	11.9	LDA,LDT1,LDT2
Building Construction	Vendor	97.5	9.10	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.9	LDA,LDT1,LDT2
Paving	Vendor	—	9.10	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	65.7	11.9	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	9.10	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	3,601,260	1,200,420	0.00	0.00	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Ton of Debris)	Material Exported (Ton of Debris)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	0.00	0.00	91.5	0.00	—
Grading	0.00	0.00	150	0.00	—
Paving	0.00	0.00	0.00	0.00	10.0

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	10.0	0%
City Park	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	8,609	8,700	7,798	3,104,819	89,176	90,121	80,769	32,160,271
City Park	12.9	32.3	36.1	6,926	116	293	327	62,642

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
3601260	1,200,420	0.00	0.00	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	7,775,447	204	0.0330	0.0040	26,530,103
City Park	0.00	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	37,094,483	183,253,781

City Park	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	806	—
City Park	1.42	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	22.9	annual days of extreme heat
Extreme Precipitation	1.00	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	0	0	0	N/A
Drought	0	0	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	1	1	1	2
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	1	1	1	2
Drought	1	1	1	2
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	57.1

AQ-PM	53.2
AQ-DPM	53.5
Drinking Water	98.2
Lead Risk Housing	13.6
Pesticides	84.4
Toxic Releases	47.3
Traffic	56.4
Effect Indicators	—
CleanUp Sites	90.1
Groundwater	99.7
Haz Waste Facilities/Generators	92.3
Impaired Water Bodies	87.0
Solid Waste	84.8
Sensitive Population	—
Asthma	69.4
Cardio-vascular	54.9
Low Birth Weights	67.9
Socioeconomic Factor Indicators	—
Education	55.5
Housing	10.5
Linguistic	58.2
Poverty	45.4
Unemployment	60.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—

Above Poverty	47.86346721
Employed	21.69896061
Median HI	53.50955986
Education	—
Bachelor's or higher	47.7223149
High school enrollment	13.5249583
Preschool enrollment	50.42987296
Transportation	—
Auto Access	85.40998332
Active commuting	18.3498011
Social	—
2-parent households	40.99833184
Voting	72.46246632
Neighborhood	—
Alcohol availability	84.01129219
Park access	41.28063647
Retail density	18.9272424
Supermarket access	35.54471962
Tree canopy	34.71063775
Housing	—
Homeownership	64.8659053
Housing habitability	69.85756448
Low-inc homeowner severe housing cost burden	40.10008982
Low-inc renter severe housing cost burden	74.20762223
Uncrowded housing	60.05389452
Health Outcomes	—
Insured adults	32.31104838
Arthritis	15.6

Asthma ER Admissions	25.2
High Blood Pressure	6.0
Cancer (excluding skin)	24.3
Asthma	46.1
Coronary Heart Disease	6.8
Chronic Obstructive Pulmonary Disease	25.1
Diagnosed Diabetes	31.9
Life Expectancy at Birth	48.2
Cognitively Disabled	72.6
Physically Disabled	69.8
Heart Attack ER Admissions	20.0
Mental Health Not Good	48.5
Chronic Kidney Disease	27.1
Obesity	41.7
Pedestrian Injuries	81.9
Physical Health Not Good	43.5
Stroke	26.0
Health Risk Behaviors	—
Binge Drinking	41.7
Current Smoker	38.5
No Leisure Time for Physical Activity	42.7
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	18.1
Elderly	82.5
English Speaking	26.9
Foreign-born	72.3

Outdoor Workers	45.7
Climate Change Adaptive Capacity	—
Impervious Surface Cover	72.2
Traffic Density	71.1
Traffic Access	0.0
Other Indices	—
Hardship	56.7
Other Decision Support	—
2016 Voting	47.9

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	86.0
Healthy Places Index Score for Project Location (b)	42.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Land uses as provided in Chapter 2.0: Project Description of the Draft EIR.
Construction: Construction Phases	Construction schedule simplified for the purposes of modeling. Buildout year of 2026.
Operations: Hearths	No fireplaces or wood stoves.
Operations: Consumer Products	Revised General Category consumer products emissions factor to reflect CARB adjustments applied to their Consumer and Commercial Product Survey Emission data, made after the 2008 consumer products emissions factor. Adjustment made to reflect average adjustment factor. See for further detail: https://ww2.arb.ca.gov/our-work/programs/consumer-products-program/consumer-products-emissio 0.0000107

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: San Joaquin (SJV)
Calendar Year: 2025, 2026
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	Trips	Fuel Consumption	**MPG**		
San Joaquin (SJV)	2025	All Other Buses	Aggregate	Aggregate	Diesel	67.92171408086016	3454.279589063632	604.5032553196555	0.39533893193203046	**8.737514**		
San Joaquin (SJV)	2025	LDA	Aggregate	Aggregate	Gasoline	247812.19302818994	10065418.676515227	1143376.6430422298	337.32097769325264	**29.83929**		
San Joaquin (SJV)	2025	LDA	Aggregate	Aggregate	Diesel	620.8563182756516	19917.73747025275	2643.071073994998	0.45868653335551524	**43.42342**		
San Joaquin (SJV)	2025	LDT1	Aggregate	Aggregate	Gasoline	20969.62888779305	704503.5262022691	90823.61908	28.333450493871023	**24.86473**		
San Joaquin (SJV)	2025	LDT1	Aggregate	Aggregate	Diesel	5.057977491416707	54.798571868843425	14.332473866997148	0.002229936	**24.57406**		
San Joaquin (SJV)	2025	LDT2	Aggregate	Aggregate	Gasoline	105887.27338604984	4297523.941	491668.9279136461	175.75070604691192	**24.45239**		
San Joaquin (SJV)	2025	LDT2	Aggregate	Aggregate	Diesel	305.5941154444118	13558.418614140355	1463.9618412705443	0.40134555033956476	**33.78241**		
San Joaquin (SJV)	2025	LHD1	Aggregate	Aggregate	Gasoline	9450.489324075776	335570.01813041593	140798.2096996362	34.90157426260361	**9.614753**		
San Joaquin (SJV)	2025	LHD1	Aggregate	Aggregate	Diesel	8447.684296292902	292201.9819730649	106261.24126051996	18.381635115917703	**15.89641**		
San Joaquin (SJV)	2025	LHD2	Aggregate	Aggregate	Gasoline	1129.168713867278	39496.24366301172	16822.93137523879	4.600897481565843	**8.584465**		
San Joaquin (SJV)	2025	LHD2	Aggregate	Aggregate	Diesel	3098.911716294119	112092.22703690466	38980.41096004093	8.493201579408552	**13.19788**		
San Joaquin (SJV)	2025	MCY	Aggregate	Aggregate	Gasoline	12009.699990662624	64631.082735185766	24019.399981325252	1.5989677176576207	**40.42051**		
San Joaquin (SJV)	2025	MDV	Aggregate	Aggregate	Gasoline	92446.53151623823	3253692.8956344584	417141.12322548917	166.8506732134557	**19.50063**		
San Joaquin (SJV)	2025	MDV	Aggregate	Aggregate	Diesel	1393.0914924002393	51951.97719843001	6420.977753755932	2.120474723022544	**24.50016**		
San Joaquin (SJV)	2025	MH	Aggregate	Aggregate	Gasoline	1345.7346602049631	11738.09808827038	134.6272954069045	2.660033836059537	**4.412763**		
San Joaquin (SJV)	2025	MH	Aggregate	Aggregate	Diesel	631.6240767665751	5453.241176732226	63.16240767665751	0.580283559	**9.397546**		
San Joaquin (SJV)	2025	Motor Coach	Aggregate	Aggregate	Diesel	18.807729217460952	2514.5150141920503	432.20161741725263	0.45291764681580127	**5.551815**		
San Joaquin (SJV)	2025	OBUS	Aggregate	Aggregate	Gasoline	170.83249943177347	7309.030243834568	3418.016648630924	1.5224818402207991	**4.800734**		
San Joaquin (SJV)	2025	PTO	Aggregate	Aggregate	Diesel	0	20105.42266383636	0	3.984270459848544	**5.046199**		
San Joaquin (SJV)	2025	SBUS	Aggregate	Aggregate	Gasoline	131.61897835306777	7271.2946765388615	526.4759134122711	0.7134123202105864	**10.19228**		
San Joaquin (SJV)	2025	SBUS	Aggregate	Aggregate	Diesel	490.2787138555924	10849.654791508496	7099.235776628981	1.3207417946582871	**8.214819**		
San Joaquin (SJV)	2025	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	10.576104179385425	697.7424444540283	243.03887404227714	0.077548733	**8.997471**		
San Joaquin (SJV)	2025	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	14.005516287489614	958.7557722162195	321.84676428651136	0.10661777899787131	**8.992457**		
San Joaquin (SJV)	2025	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	47.29566682683535	2488.3553063204045	1086.8544236806765	0.27242657859909153	**9.13404**		
San Joaquin (SJV)	2025	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	78.11014264837554	15772.077295952173	1794.9710780596702	1.6056871388606164	**9.822634**	**MHD**	
San Joaquin (SJV)	2025	T6 Instate Delivery C	Aggregate	Aggregate	Diesel	252.42486797237123	8475.971925835316	3602.1028659657377	1.0191162888980565	**8.316982**		**8.560963**
San Joaquin (SJV)	2025	T6 Instate Delivery C	Aggregate	Aggregate	Diesel	162.49073664455776	5516.894156796931	2318.7428119178394	0.6663504110509904	**8.279269**		
San Joaquin (SJV)	2025	T6 Instate Delivery C	Aggregate	Aggregate	Diesel	708.1406494980133	23932.07473814656	10105.167068336652	2.8778844195080135	**8.315857**		
San Joaquin (SJV)	2025	T6 Instate Delivery C	Aggregate	Aggregate	Diesel	127.2799027300884	6929.155342698256	1816.284211958362	0.825964977	**8.389164**		
San Joaquin (SJV)	2025	T6 Instate Other Cla	Aggregate	Aggregate	Diesel	457.38438016387573	18839.146045146714	5287.363434694405	2.2000268219115364	**8.563144**		
San Joaquin (SJV)	2025	T6 Instate Other Cla	Aggregate	Aggregate	Diesel	1233.945904313021	53254.29452492133	14264.414653858517	6.208167542030212	**8.578102**		
San Joaquin (SJV)	2025	T6 Instate Other Cla	Aggregate	Aggregate	Diesel	939.5521796590996	39531.72195	10861.22319685919	4.582174013930858	**8.627285**		
San Joaquin (SJV)	2025	T6 Instate Other Cla	Aggregate	Aggregate	Diesel	601.2468734051956	26326.73813782712	6950.413856564062	3.0029448137800916	**8.766974**		
San Joaquin (SJV)	2025	T6 Instate Tractor Cl	Aggregate	Aggregate	Diesel	11.094111944234575	521.2715645	128.2479340753517	0.060836197	**8.568444**		
San Joaquin (SJV)	2025	T6 Instate Tractor Cl	Aggregate	Aggregate	Diesel	742.8431118379566	44239.50122550641	8587.266372846781	4.878765067334002	**9.067766**		
San Joaquin (SJV)	2025	T6 OOS Class 4	Aggregate	Aggregate	Diesel	6.191325924192232	405.51548406000154	142.27666973793748	0.044545776156118454	**9.103343**		
San Joaquin (SJV)	2025	T6 OOS Class 5	Aggregate	Aggregate	Diesel	8.158025029	556.2943227890185	187.47141517644255	0.061223253	**9.086324**		
San Joaquin (SJV)	2025	T6 OOS Class 6	Aggregate	Aggregate	Diesel	27.75525514713501	1453.6129812370502	637.8157632811625	0.1567205744225662	**9.275189**		
San Joaquin (SJV)	2025	T6 OOS Class 7	Aggregate	Aggregate	Diesel	42.05361036926817	10569.573926041505	966.3919662857828	1.0668567672422624	**9.90721**		
San Joaquin (SJV)	2025	T6 Public Class 4	Aggregate	Aggregate	Diesel	30.963405165300866	1050.7778201520712	158.84226849799344	0.13705132635680242	**7.667039**		
San Joaquin (SJV)	2025	T6 Public Class 5	Aggregate	Aggregate	Diesel	77.40598482	2785.9097571508278	397.0927021143608	0.35771388142427163	**7.788095**		
San Joaquin (SJV)	2025	T6 Public Class 6	Aggregate	Aggregate	Diesel	124.46486451097007	4446.562532596154	638.5047549412767	0.5664541768681545	**7.849819**		
San Joaquin (SJV)	2025	T6 Public Class 7	Aggregate	Aggregate	Diesel	148.2002736463661	6742.466603176895	760.2674038	0.8567021133536119	**7.870258**		
San Joaquin (SJV)	2025	T6 Utility Class 5	Aggregate	Aggregate	Diesel	33.80713565609237	1371.2626496782339	432.7313363979824	0.1540528223802547	**8.90125**		
San Joaquin (SJV)	2025	T6 Utility Class 6	Aggregate	Aggregate	Diesel	6.404694196690385	258.7537932237553	81.98008571763694	0.028984726116801054	**8.927246**		
San Joaquin (SJV)	2025	T6 Utility Class 7	Aggregate	Aggregate	Diesel	7.233394317695058	359.3994629294224	92.58744726649677	0.039964166481518675	**8.993043**		
San Joaquin (SJV)	2025	T6TS	Aggregate	Aggregate	Gasoline	531.0756315565603	27321.539958065143	10625.76123618366	5.695995374332773	**4.796623**		
San Joaquin (SJV)	2025	T7 CAIRP Class 8	Aggregate	Aggregate	Diesel	1559.3836757081838	317454.14482787263	35834.63686777406	51.17555420625294	**6.203238**	**HHD**	
San Joaquin (SJV)	2025	T7 NNOOS Class 8	Aggregate	Aggregate	Diesel	1399.9863536033636	379791.5025452474	32171.686405805296	59.50406301612127	**6.382615**		**5.735417**
San Joaquin (SJV)	2025	T7 NOOS Class 8	Aggregate	Aggregate	Diesel	592.9033382638501	137971.5066545003	13624.918713303272	22.139490358020147	**6.231919**		
San Joaquin (SJV)	2025	T7 Other Port Class 8	Aggregate	Aggregate	Diesel	31.094663206334175	5773.393666684279	508.70869005562713	0.965450648	**5.979999**		
San Joaquin (SJV)	2025	T7 POAK Class 8	Aggregate	Aggregate	Diesel	137.42848651351414	13680.636583532423	2248.3300393610916	2.3339917309258538	**5.861476**		
San Joaquin (SJV)	2025	T7 POLA Class 8	Aggregate	Aggregate	Diesel	157.47881799218516	19849.822038835886	2576.353462	3.419583802557895	**5.804748**		
San Joaquin (SJV)	2025	T7 Public Class 8	Aggregate	Aggregate	Diesel	386.4284577368514	16615.45100926415	1982.3779881900484	3.1579629410685977	**5.261446**		
San Joaquin (SJV)	2025	T7 Single Concrete/T	Aggregate	Aggregate	Diesel	121.09995780736584	8533.431514	1140.7616025453865	1.4286803361044438	**5.972947**		
San Joaquin (SJV)	2025	T7 Single Dump Clas	Aggregate	Aggregate	Diesel	518.3758673666437	30855.221668118047	4883.100670593784	5.328325631732942	**5.790791**		
San Joaquin (SJV)	2025	T7 Single Other Clas	Aggregate	Aggregate	Diesel	1163.187559160646	58572.11237296468	10957.226807293291	9.897066106606317	**5.918129**		
San Joaquin (SJV)	2025	T7 SWCV Class 8	Aggregate	Aggregate	Diesel	167.55684484225907	10862.33675011536	770.7614862743918	4.227120942679934	**2.569677**		
San Joaquin (SJV)	2025	T7 Tractor Class 8	Aggregate	Aggregate	Diesel	2947.082282493532	219605.84394253956	42821.10556463101	35.73125002181183	**6.146044**		
San Joaquin (SJV)	2025	T7 Utility Class 8	Aggregate	Aggregate	Diesel	24.55225090086409	1096.5457305707098	314.2688115310604	0.18759161637273178	**5.845388**		
San Joaquin (SJV)	2025	T7IS	Aggregate	Aggregate	Gasoline	1.372290650971562	54.29517763626372	27.456791344639015	0.014900232792272016	**3.643915**		
San Joaquin (SJV)	2025	UBUS	Aggregate	Aggregate	Gasoline	50.679935537012945	3818.163153707286	202.71974214805178	0.8127223914834449	**4.697992**		
San Joaquin (SJV)	2025	UBUS	Aggregate	Aggregate	Diesel	73.34639923573349	4977.172651620043	293.38559694293394	0.5263310010553903	**9.456355**		
San Joaquin (SJV)	2026	All Other Buses	Aggregate	Aggregate	Diesel	70.56624980582656	3479.0281151037684	628.0396232718563	0.39542179236926955	**8.798271**		
San Joaquin (SJV)	2026	LDA	Aggregate	Aggregate	Gasoline	248954.34710828812	10081616.21598171	1148076.3248210326	330.9894835268596	**30.45902**		
San Joaquin (SJV)	2026	LDA	Aggregate	Aggregate	Diesel	575.6642268881487	18287.29038466732	2448.7880713560094	0.4163913187644543	**43.91852**		
San Joaquin (SJV)	2026	LDT1	Aggregate	Aggregate	Gasoline	20548.59515861114	692970.4437188674	89115.05589130247	27.316600073375717	**25.36811**		
San Joaquin (SJV)	2026	LDT1	Aggregate	Aggregate	Diesel	4.569019972199411	48.12886228195957	12.718521208176782	0.001953514	**24.63707**		
San Joaquin (SJV)	2026	LDT2	Aggregate	Aggregate	Gasoline	108966.88045462813	4418192.449757271	506128.26385969255	176.20566449362678	**25.07407**		
San Joaquin (SJV)	2026	LDT2	Aggregate	Aggregate	Diesel	326.57412754097805	14345.45726148266	1561.5196267025258	0.4157066541207551	**34.50861**		
San Joaquin (SJV)	2026	LHD1	Aggregate	Aggregate	Gasoline	9286.217244998841	330876.2233409485	138350.80048678772	33.86472664183086	**9.770527**		
San Joaquin (SJV)	2026	LHD1	Aggregate	Aggregate	Diesel	8223.369797620311	281945.29786629387	103439.64705485814	17.804196430530506	**15.83589**		
San Joaquin (SJV)	2026	LHD2	Aggregate	Aggregate	Gasoline	1106.269293189958	38648.46441082648	16481.764127283524	4.442515888882494	**8.69968**		
San Joaquin (SJV)	2026	LHD2	Aggregate	Aggregate	Diesel	3071.3447383518733	109795.10805642571	38633.653056785704	8.325071543898911	**13.18849**		
San Joaquin (SJV)	2026	MCY	Aggregate	Aggregate	Gasoline	11953.198713647253	64028.24505942758	23906.397427294512	1.5775053051751968	**40.58829**		
San Joaquin (SJV)	2026	MDV	Aggregate	Aggregate	Gasoline	91590.44942449027	3218634.994840785	413061.2375884091	161.34129744468544	**19.94923**		
San Joaquin (SJV)	2026	MDV	Aggregate	Aggregate	Diesel	1387.0905849519588	50484.501186564805	6352.195347493513	2.0332366765294307	**24.82962**		
San Joaquin (SJV)	2026	MH	Aggregate	Aggregate	Gasoline	1275.2110309050913	11138.78338532308	127.57211153174535	2.5238811216156214	**4.413355**		
San Joaquin (SJV)	2026	MH	Aggregate	Aggregate	Diesel	624.9287031	5349.741786072656	62.49287030515299	0.569474751	**9.394169**		
San Joaquin (SJV)	2026	Motor Coach	Aggregate	Aggregate	Diesel	19.59809919076467	2529.5668844208503	450.3643194037721	0.45113467131050916	**5.607121**		
San Joaquin (SJV)	2026	OBUS	Aggregate	Aggregate	Gasoline	165.01630317222535	6952.666959629456	3301.6461938698826	1.4321736094641988	**4.854626**		
San Joaquin (SJV)	2026	PTO	Aggregate	Aggregate	Diesel	0	20206.49659224057	0	3.9554397771665997	**5.108533**		
San Joaquin (SJV)	2026	SBUS	Aggregate	Aggregate	Gasoline	133.42888588081001	7368.829633143594	533.7155435232402	0.7215696031969262	**10.21222**		
San Joaquin (SJV)	2026	SBUS	Aggregate	Aggregate	Diesel	490.26505130874637	10760.715301575525	7099.037942950645	1.306150129322719	**8.238498**	**MHD**	
San Joaquin (SJV)	2026	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	10.660016181010214	701.3859488653427	244.96717183961465	0.077337026	**9.069213**		**8.631783**
San Joaquin (SJV)	2026	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	14.035222153574377	964.6040144937781	322.5294050891393	0.10650744626849068	**9.056681**		
San Joaquin (SJV)	2026	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	48.72973293	2495.655608678627	1119.8092627643694	0.27123401458012814	**9.201116**		
San Joaquin (SJV)	2026	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	79.28506420992728	15904.601883122563	1821.9707755441295	1.5980911846235921	**9.952249**		
San Joaquin (SJV)	2026	T6 Instate Delivery C	Aggregate	Aggregate	Diesel	255.70797548892784	8547.609073	3648.95281	1.021696518871943	**8.366094**		
San Joaquin (SJV)	2026	T6 Instate Delivery C	Aggregate	Aggregate	Diesel	165.02254192688648	5564.906887104627	2354.871673296669	0.6681177492258951	**8.329231**		
San Joaquin (SJV)	2026	T6 Instate Delivery C	Aggregate	Aggregate	Diesel	718.3026341	24138.149536821256	10250.178588496647	2.8857931134918955	**8.364477**		
San Joaquin (SJV)	2026	T6 Instate Delivery C	Aggregate	Aggregate	Diesel	130.9074149402733	7029.251887065683	1868.0488111977004	0.8361151668174901	**8.407038**		
San Joaquin (SJV)	2026	T6 Instate Other Cla	Aggregate	Aggregate	Diesel	462.35376328470574	18980.536148371353	5344.809503571199	2.2033083897973813	**8.614562**		
San Joaquin (SJV)	2026	T6 Instate Other Cla	Aggregate	Aggregate	Diesel	1262.1169700317341	53712.823423423986	14590.072173566843	6.231245747	**8.619917**		
San Joaquin (SJV)	2026	T6 Instate Other Cla	Aggregate	Aggregate	Diesel	953.7931661997087	39855.13691508251	11025.849001268629	4.596834502716666	**8.670127**		
San Joaquin (SJV)	2026	T6 Instate Other Cla	Aggregate	Aggregate	Diesel	625.5511505926845	26603.019850356675	7231.371300851433	3.0235460826387905	**8.798616**		
San Joaquin (SJV)	2026	T6 Instate Tractor Cl	Aggregate	Aggregate	Diesel	11.271920699444982	523.9905267	130.30340328558398	0.060673892174648525	**8.636178**		
San Joaquin (SJV)	2026	T6 Instate Tractor Cl	Aggregate	Aggregate	Diesel	774.7380462624084	44791.51977419804	8955.971814793438	4.904780693452797	**9.132217**		
San Joaquin (SJV)	2026	T6 OOS Class 4	Aggregate	Aggregate	Diesel	6.303941507	412.2710384651902	144.86457583293299	0.044613282	**9.240993**		
San Joaquin (SJV)	2026	T6 OOS Class 5	Aggregate	Aggregate	Diesel	8.256009649	565.5617286233738	189.72310173459334	0.061388258	**9.212865**		
San Joaquin (SJV)	2026	T6 OOS Class 6	Aggregate	Aggregate	Diesel	28.956385635273865	1477.8289778261774	665.4177418985934	0.15687431915024266	**9.420465**		
San Joaquin (SJV)	2026	T6 OOS Class 7	Aggregate	Aggregate	Diesel	42.63944302526575	10745.654333581446	979.8544007206069	1.0684414382856986	**10.05732**		
San Joaquin (SJV)	2026	T6 Public Class 4	Aggregate	Aggregate	Diesel	30.388938458317796	1047.547750264348	155.89525429117032	0.13525533803994394	**7.744964**		
San Joaquin (SJV)	2026	T6 Public Class 5	Aggregate	Aggregate	Diesel	77.69634659129818	2787.413562092653	398.58225801335954	0.3555491492109271	**7.839742**		
San Joaquin (SJV)	2026	T6 Public Class 6	Aggregate	Aggregate	Diesel	123.35994443601385	4439.253387	632.8365149567509	0.5610252376557977	**7.912752**		
San Joaquin (SJV)	2026	T6 Public Class 7	Aggregate	Aggregate	Diesel	147.13106136409232	6729.563496357582	754.7823447977934	0.8455211050498318	**7.959072**		
San Joaquin (SJV)	2026	T6 Utility Class 5	Aggregate	Aggregate	Diesel	33.874281744655605	1370.0287213397494	433.59080633159164	0.15313524900104278	**8.946528**		
San Joaquin (SJV)	2026	T6 Utility Class 6	Aggregate	Aggregate	Diesel	6.414208336003405	258.5406333059198	82.10186670084356	0.028816779778612387	**8.971878**		
San Joaquin (SJV)	2026	T6 Utility Class 7	Aggregate	Aggregate	Diesel	7.198143300811409	358.3569467012206	92.13623425038604	0.039620159289400485	**9.044813**		
San Joaquin (SJV)	2026	T6TS	Aggregate	Aggregate	Gasoline	520.4470171872192	27274.272976544453	10413.10391988188	5.615162294849738	**4.857255**		
San Joaquin (SJV)	2026	T7 CAIRP Class 8	Aggregate	Aggregate	Diesel	1578.6312918113047	321111.9354	36276.947085823784	50.99627768636247	**6.296772**	**HHD**	
San Joaquin (SJV)	2026	T7 NNOOS Class 8	Aggregate	Aggregate	Diesel	1425.0818004098342	387551.76540851133	32748.379773417997	59.27165108339784	**6.538569**		**5.626934**
San Joaquin (SJV)	2026	T7 NOOS Class 8	Aggregate	Aggregate	Diesel	607.0841877723443	140790.6723075073	13950.794635008473	22.17399713617642	**6.349359**		
San Joaquin (SJV)	2026	T7 Other Port Class 8	Aggregate	Aggregate	Diesel	31.243676657306146	5956.062674281641	511.1465501135288	0.987429204	**6.031888**		
San Joaquin (SJV)	2026	T7 POAK Class 8	Aggregate	Aggregate	Diesel	137.34934659713772	13837.66738951243	2247.0353103291727	2.3466972939977926	**5.896656**		
San Joaquin (SJV)	2026	T7 POLA Class 8	Aggregate	Aggregate	Diesel	161.3596562	20610.491814685265	2639.843975750316	3.544688762607223	**5.814472**		
San Joaquin (SJV)	2026	T7 Public Class 8	Aggregate	Aggregate	Diesel	387.19838224740016	16643.567787528358	1986.3277009291623	3.1367335034204293	**5.306019**		
San Joaquin (SJV)	2026	T7 Single Concrete/T	Aggregate	Aggregate	Diesel	121.40859936239141	8455.615652588493	1143.669005993727	1.4016328068427193	**6.03269**		
San Joaquin (SJV)	2026	T7 Single Dump Clas	Aggregate	Aggregate	Diesel	530.5095412925928	30751.21337339267	4997.399878976224	5.283641034	**5.82008**		
San Joaquin (SJV)	2026	T7 Single Other Clas	Aggregate	Aggregate	Diesel	1221.7000608623905	59229.59198114903	11508.414573323718	9.954880754	**5.949804**		
San Joaquin (SJV)	2026	T7 SWCV Class 8	Aggregate	Aggregate	Diesel	163.68560164422613	10612.165104433414	752.9537675634404	4.089572702849882	**2.594932**		
San Joaquin (SJV)	2026	T7 Tractor Class 8	Aggregate	Aggregate	Diesel	3087.8172192619177	223163.8124220475	44865.98419587564	36.03412299407526	**6.193125**		
San Joaquin (SJV)	2026	T7 Utility Class 8	Aggregate	Aggregate	Diesel	25.045839997072278	1101.4529023079513	320.58675196252517	0.18743349951509924	**5.8765**		
San Joaquin (SJV)	2026	T7IS	Aggregate	Aggregate	Gasoline	0.716847418	49.354295421571344	14.342683149099102	0.012107906994236197	**4.076204**		
San Joaquin (SJV)	2026	UBUS	Aggregate	Aggregate	Gasoline	51.25091275616734	3861.179865482489	205.00365102466935	0.8218885829709518	**4.697936**		
San Joaquin (SJV)	2026	UBUS	Aggregate	Aggregate	Diesel	73.64866029565297	4996.985539202107	294.5946411826119	0.5283753362643284	**9.457265**		

On-road Mobile (Operational) Energy Usage

Unmitigated:

Step 1:

Therefore:

Average Daily VMT:

616,770 Source: CalEEMod Output File

Step 2: Given:

Fleet Mix (CalEEMod Output)

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
53.5430%	5.3975%	17.5864%	14.0525%	2.2799%	0.6183%	1.4960%	2.2785%	0.0688%	0.0282%	2.2547%	0.1379%	0.2584%

And:

Gasoline MPG Factors for each Vehicle Class - Year 2026 (EMFAC2021 Output)

LDA	LDT1	LDT2	MDV	MCY	MH	OBUS
30.45902277	25.36811	25.07407	19.94923213	40.58829143	4.413355007	4.854626

Diesel MPG Factors for each Vehicle Class - Year 2026 (EMFAC2021 Output)

LHD1	LHD2	MHD	HHD	UBUS	SBUS
15.83589009	13.18849	8.631783	5.626933533	9.457264933	8.238498056

Therefore:

Weighted Average MPG Factors

Gasoline: **27.7** Diesel: **10.4**

Step 3: **Therefore:**

20,701 **daily gallons of gasoline** **4,081** **daily gallons of diesel**

or

7,555,720 **annual gallons of gasoline** **1,489,539** **annual gallons of diesel**

Off-road Mobile (Construction) Energy Usage

Note: For the sake of simplicity, and as a conservative estimation, it was assumed that all off-road vehicles use diesel fuel as an energy source.
Demolition (if applicable), Site preparation and grading off-road mobile vehicle on-site gallons of fuel are calculated below.

Given Factor:	**297.2**	**metric tons**	**CO_2**	**(provided in CalEEMod Output File)**	
Conversion Factor:	2204.6262	pounds	per metric ton		
Intermediate Result:	**655,202**	**pounds**	**CO_2**		
Conversion Factor:	22.38	pounds	CO_2 per 1 gallon of diesel fuel	Source: U.S. EIA, 2016	
Final Result:	**29,276**	**gallons**	**diesel fuel**		http://www.eia.gov/tools/faqs/faq.cfm?id=307&t=11

Mitigated Onsite Scenario	Total CO_2 (MT/yr) (provided in CalEEMod Output File)
Site Preparation - 2025	147.0
Grading - 2026	150.2

On-road Mobile (Construction) Energy Usage - Site Preparation

Step 1: **Total Daily Worker Trips (CalEEMod Output)**

18

Worker Trip Length (miles) (CalEEMod Output)

11.9

Therefore:

Average Worker Daily VMT:

214

Step 2: Given:

Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	LDT1	LDT2
0.5	0.25	0.25

And:

Gasoline MPG Factors for each Vehicle Class - Year 2026 (EMFAC2021 Output)

LDA	LDT1	LDT2
30.459023	25.36811	25.07407

Therefore:

Weighted Average Worker MPG Factor

27.8

Step 3: **Therefore:**

7.7 Worker daily gallons of gasoline

Step 4: 61 **# of Days (CalEEMod Output)**

Therefore:

Result: **469 Total gallons of gasoline**

On-road Mobile (Construction) Energy Usage - Grading

Step 1: **Total Daily Worker Trips (CalEEMod Output)**

20

Worker Trip Length (miles) (CalEEMod Output)

11.9

Therefore:

Average Worker Daily VMT:

238

Step 2: Given:

Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	**LDT1**	**LDT2**
0.5	0.25	0.25

And:

Gasoline MPG Factors for each Vehicle Class - Year 2026 (EMFAC2021 Output)

LDA	**LDT1**	**LDT2**
30.459023	25.368107	25.074066

Therefore:

Weighted Average Worker MPG Factor

27.8

Step 3: **Therefore:**

8.5 Worker daily gallons of gasoline

Step 4: 50 **# of Days (CalEEMod Output)**

Therefore:

Result: **427** **Total gallons of gasoline**

On-road Mobile (Construction) Energy Usage - Building Construction

Step 1:

Total Daily Worker Trips (CalEEMod Output)

328	5%	**16**

Total Daily Vendor Trips (CalEEMod Output)

98	5%	**5**

Note: Assumes 5% of Plan Area under construction at given point in time (on average) until buildout.

Worker Trip Length (miles) (CalEEMod Output)
11.9

Vendor Trip Length (miles) (CalEEMod Output)
9.1

Therefore:

Average Worker Daily VMT:
195

Average Vendor Daily VMT:
44

Step 2:

Given:

Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	**LDT1**	**LDT2**
0.5	0.25	0.25

Assumed Fleet Mix for Vendors

Fleet Mix for Workers (CalEEMod Output)

MHD	**HHD**
0%	100%

And:

Gasoline MPG Factors for each Vehicle Class - Year 2026 (EMFAC2021 Output)

Gasoline:

LDA	**LDT1**	**LDT2**
30.4590228	25.36811	25.07407

Diesel:

MHD	**HHD**
8.631783002	5.626934

Therefore:

Weighted Average Worker (Gasoline) MPG Factor
27.8

Weighted Average Vendor (Diesel) MPG Factor
5.6

Step 3:

Therefore:
7 Worker daily gallons of gasoline

Therefore:
8 Vendor daily gallons of diesel

Step 4:

325 **# of Days (CalEEMod Output)**

Therefore:
2,278 Total gallons of gasoline

Therefore:
2,562 Total gallons of diesel

On-road Mobile (Construction) Energy Usage - Paving

Step 1: **Total Daily Worker Trips (CalEEMod Output)**

15

Worker Trip Length (miles) (CalEEMod Output)

11.9

Therefore:

Average Worker Daily VMT:

179

Step 2: Given:

Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	LDT1	LDT2
0.5	0.25	0.25

And:

Gasoline MPG Factors for each Vehicle Class - Year 2026 (EMFAC2021 Output)

LDA	LDT1	LDT2
30.459023	25.368107	25.074066

Therefore:

Weighted Average Worker MPG Factor

27.8

Step 3: **Therefore:**

6.4 Worker daily gallons of gasoline

Step 4: 86 **# of Days (CalEEMod Output)**

Therefore:

Result: **551** **Total gallons of gasoline**

On-road Mobile (Construction) Energy Usage - Architectural Coating

Step 1: **Total Daily Worker Trips (CalEEMod Output)**

66	5%	3

Note: Assumes 5% of Plan Area under construction at given point in time (on average) until buildout.

Worker Trip Length (miles) (CalEEMod Output)

11.9

Therefore:

Average Worker Daily VMT:

39

Step 2: Given:

Assumed Fleet Mix for Workers (Percentage mix is provided on Appendix A: Calculation Details for CalEEMOD p. 15)

LDA	**LDT1**	**LDT2**
0.5	0.25	0.25

And:

Gasoline MPG Factors for each Vehicle Class - Year 2026 (EMFAC2021 Output)

LDA	**LDT1**	**LDT2**
30.459023	25.368107	25.074066

Therefore:

Weighted Average Worker MPG Factor

27.8

Step 3: **Therefore:**

1.4 Worker daily gallons of gasoline

Step 4: 325 **# of Days (CalEEMod Output)**

Therefore:

Result: **456 Total gallons of gasoline**

APPENDIX C.1

Cultural Resource Assessment

CULTURAL RESOURCE ASSESSMENT

FOR THE MOSSDALE LANDING WEST

PROJECT, CITY OF LATHROP,

SAN JOAQUIN COUNTY, CALIFORNIA

Prepared by

Melinda A. Peak
Peak & Associates, Inc.
3941 Park Drive, Suite 20-329
El Dorado Hills, CA 95762
(916) 939-2405

Prepared for

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, CA 95762

March 18, 2024
(Job #22-030)

INTRODUCTION

Project Location

The Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site) is located within the West Lathrop Specific Plan (WLSP) area in the City of Lathrop, San Joaquin County, California (Figures 2.0-1 and 2.0-2). The site is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south.

The Project site includes two distinct planning boundaries defined below. The following terms are used throughout this Draft EIR to describe the planning boundaries within the Project site:

- **Mossdale Landing West Specific Plan Area (Specific Plan Area, Plan Area, or Project site)** – totals 225.86 acres and includes the whole of the Project, including the proposed 167.42-acre Development Area, and land along the San Joaquin River (which would not be developed as part of the proposed Project).
- **Development Area** – includes 167.42 acres that is intended for development.

The Specific Plan Area is comprised of the following APNs (Figure 2.0-3):

- 191-190-010;
- 191-190-720;
- 191-610-020;
- 191-610-220;
- 191-620-590; and
- 191-340-030.

Site Topography

The elevation of the site is generally flat and ranges from approximately 14 feet to 21 feet above mean sea level (MSL). The majority of the site is flat, with slopes existing along the San Joaquin River.

Existing Site Uses

The majority of the Plan Area is currently undeveloped (Figure 2.0-4). There is a two-story single-family residential structure east of River Islands Parkway near the San Joaquin River. There are approximately six other structures associated with the residence, such as a barn structure and shed structures.

Existing Surrounding Uses

Surrounding land uses include the San Joaquin River and associated tributaries to the north, west, and south, vacant agricultural land San Joaquin County to the north and west, Mossdale Landing, a mixed-use master planned community with largely single-family residences in the Project vicinity to the east, and single-family residential uses to the west and south.

Project Goals and Objectives

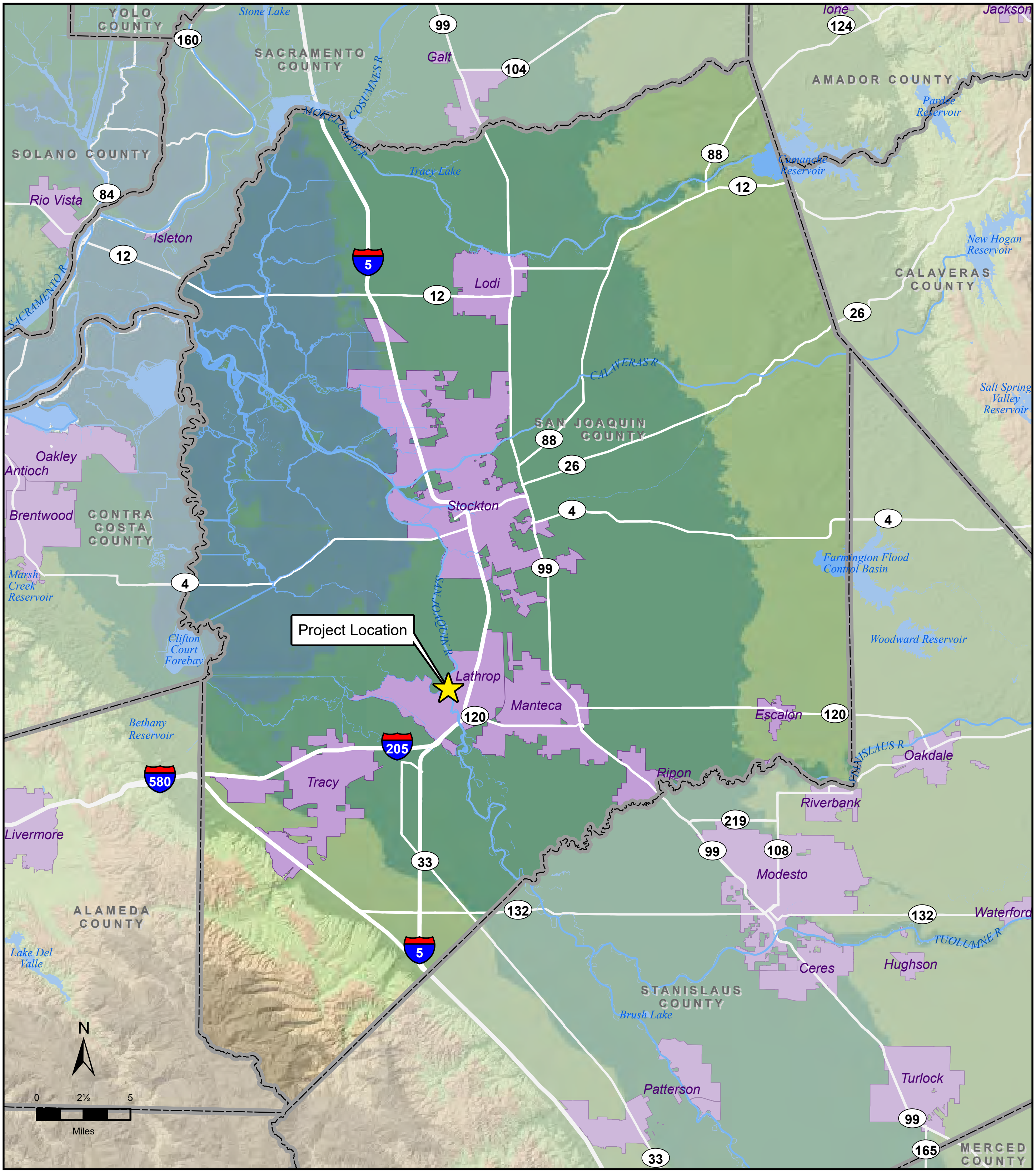
Consistent with CEQA Guidelines Section 15124(b), a clear statement of objectives and the underlying purpose of the proposed Project shall be discussed.

The underlying purpose of the proposed Project is the approval and subsequent implementation of the Specific Plan as a means of increasing the housing supply in San Joaquin County and the State of California.

- Complete neighborhoods which foster a mixture of compatibly scaled housing types on urban lots.
- A residential development that will incorporate traditional elements found throughout Central Valley communities including a hierarchy of interconnected streets, the incorporation of assorted architectural styles, tree lined thoroughfares, an emphasis upon pedestrian scale and access with a nod to the agricultural traditions of the Valley.
- Street patterns which are carefully configured to allow for multiple outlets from neighborhoods, and to provide for connections between neighborhoods, without encouraging through traffic to create convenience and access without a private automobile.
- A network of planned walkways and bikeways which make getting outside convenient, easy, and enjoyable.
- Durable construction materials and designs suited to local conditions to contribute to the ongoing costs of the housing will be encouraged.
- Provide a range of housing opportunities to support a diverse population, lifestyles, and family groups.
- Establish a planning/zoning concept that is responsive to the market.
- Implement the Phasing Plan for logical development in line with the West Lathrop Specific Plan.
- Implement City’s Infrastructure Master Plans.

Project Description

The Mossdale Landing West Specific Plan (Specific Plan or Project) would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements over five phases (Figure 2.0-5 and Figure 2.0-6). The Mossdale Landing West Specific Plan is based upon the Mossdale Village plan and policies presented in the West Lathrop Specific Plan (WLSP), which is consistent with the City of Lathrop’s General Plan. The Specific Plan provides the approximate acreages of the following land uses:



LEGEND

Incorporated Area

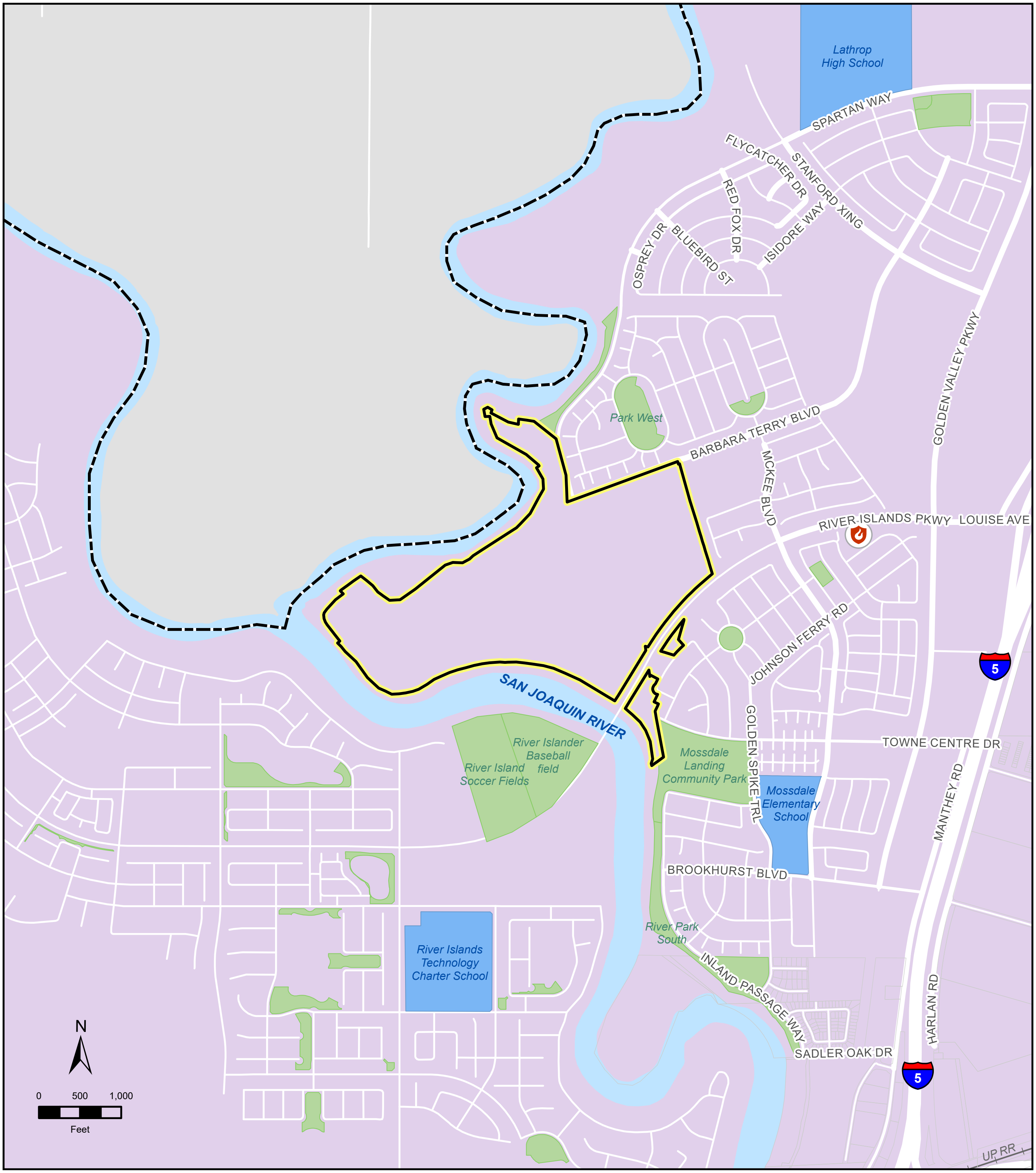
County Boundary

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-1. Regional Project Location

Sources: San Joaquin County GIS. Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



LEGEND

Project Location

Lathrop City Limits

Lathrop Fire Department - Station #34

Schools

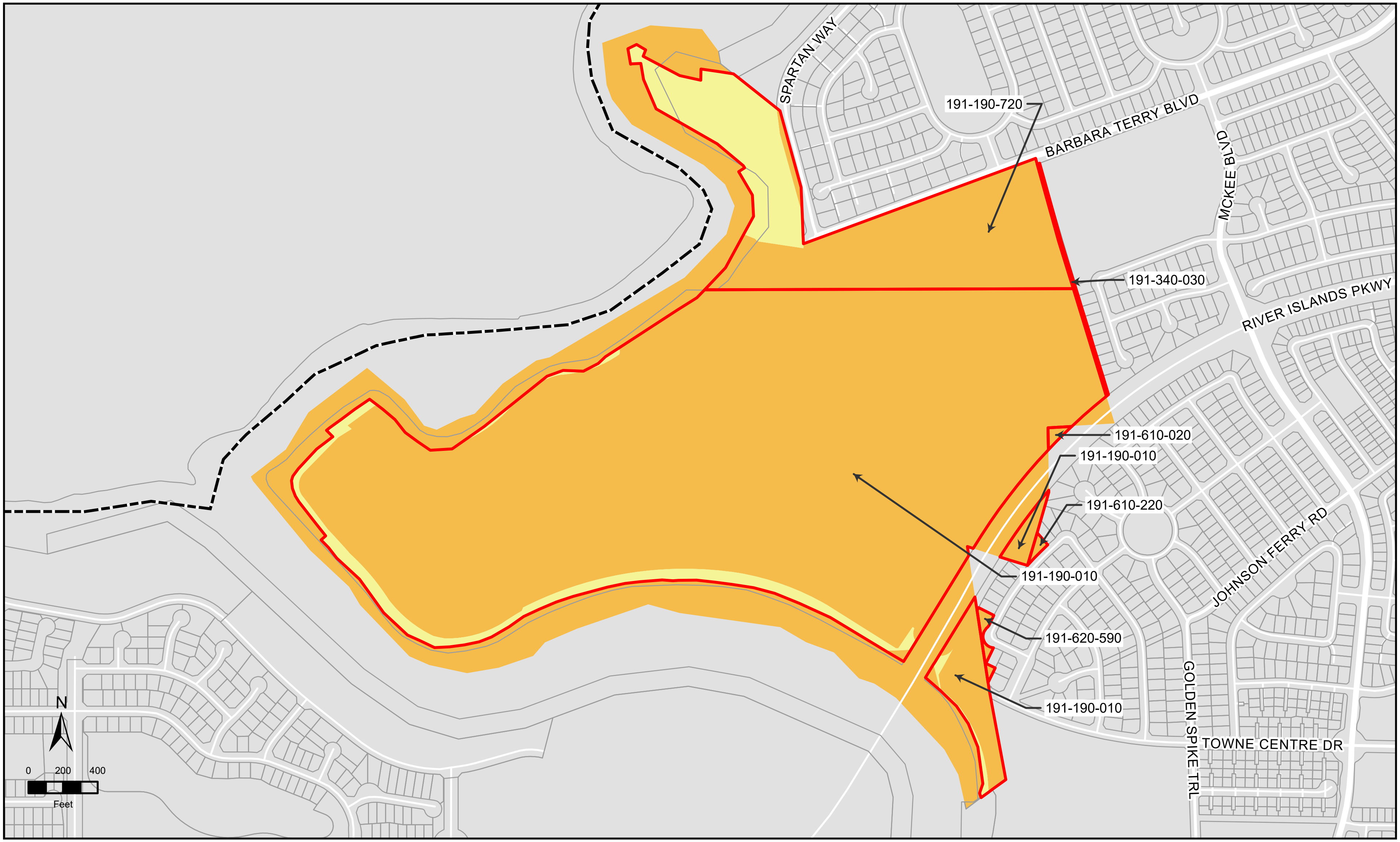
Parks

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-2. Project Vicinity

Sources: San Joaquin County GIS. Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



LEGEND

Project Parcels

Surrounding Parcels

Tracy City Limits

Property Ownership

Reclamation District #17

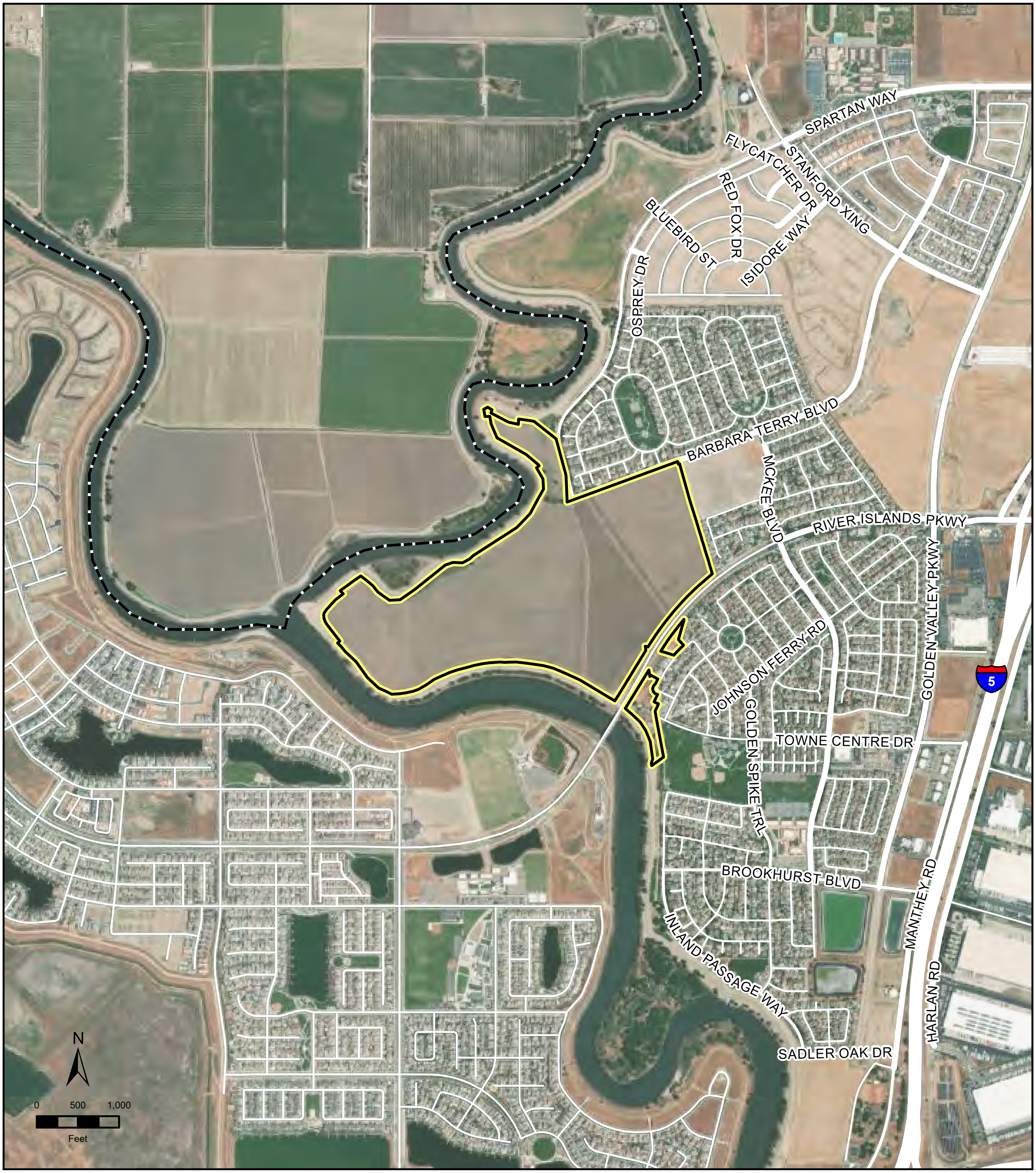
WSBG Investment LP

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-3. APN and Property Ownership

Sources: O'Dell Engineering; San Joaquin County GIS. Map date: October 26, 2022. Revised May 21, 2024.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



LEGEND

Project Location

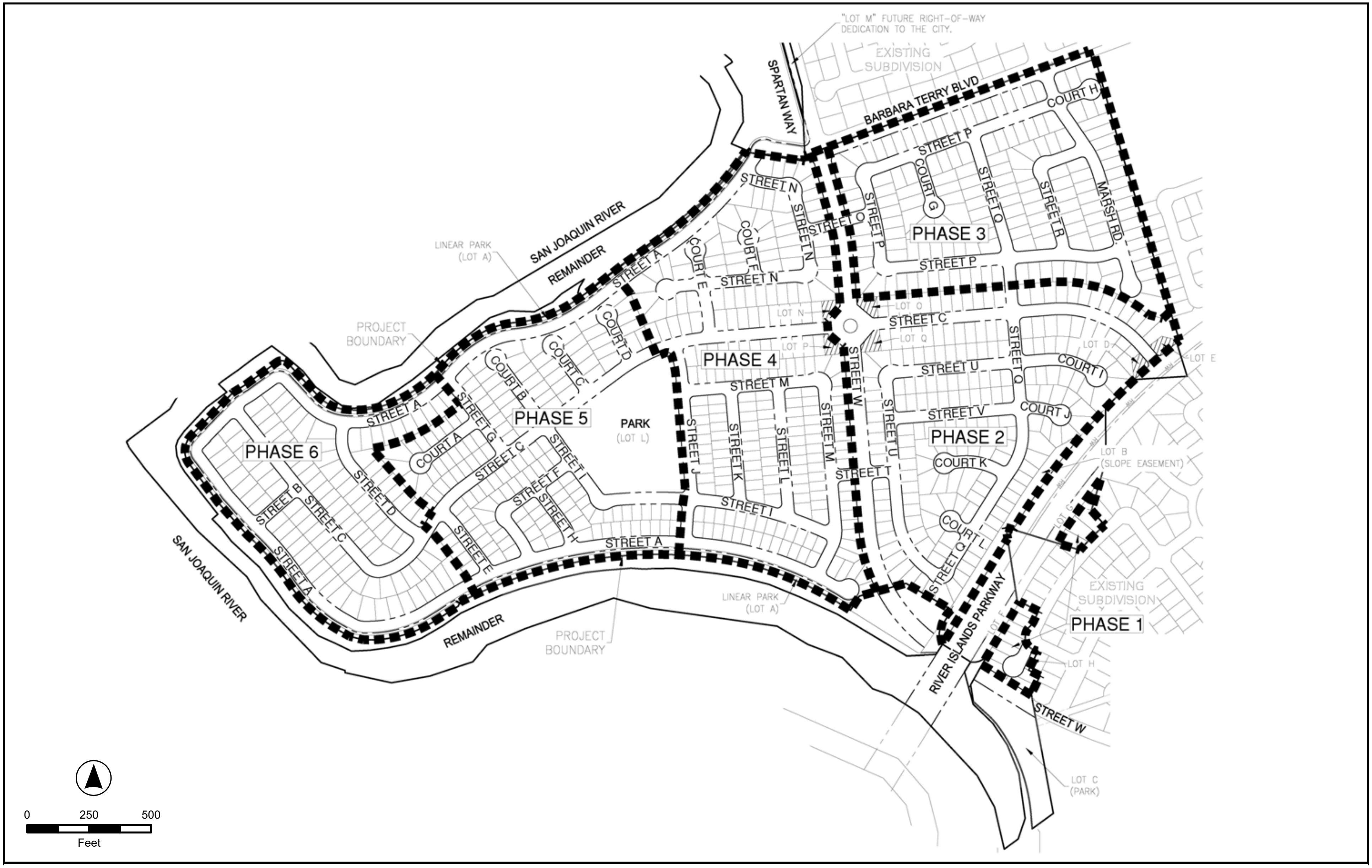
Lathrop City Limits

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-4. Aerial View of Project Site

Sources: San Joaquin County GIS, ArcGIS Online World Imagery Map Service(10/26/2022).
Map date: October 26, 2022.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm



Legend

Phase

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-5. Phasing Map

Source: O'Dell Engineering, 7/18/2024.

Legend

42'x80' and 42'x85' Lots	50'x100' Lots
45'x75' Lots	Open Space
50'x80' Lots	

LATHROP MOSSDALE LANDING WEST SPECIFIC PLAN

Figure 2.0-6. Project Site Map

Source: Mossdale West Urban Design Concept, City of Lathrop/O'Dell Engineering, 3/11/2022.

- approximately 146.7 acres of low-density residential uses;

- approximately 16.5 acres of Public designated uses that are made up of:
  - approximately 4.8 acres of linear park;
  - approximately 6.2 acres of neighborhood park;
  - approximately 2.0 acres of parkland dedication south of River Islands Parkway;
  - approximately 2.1 acres of other open space (including landscaped entries); and
  - approximately 1.4 acres of levee slope easement.

There is also a remainder of 38.2 acres of undeveloped land.

Residential

The Specific Plan provides a total of 829 dwelling units, which creates a density of 5.43 dwelling units/acre. However, to provide a residential unit buffer, a maximum of 912 units are assumed in this analysis. As such, the analysis is conservative as the number of units constructed at buildout would likely be closer to 829, as shown on the Vesting Tentative Subdivision Map.

The Specific Plan will provide a singular housing type: low-density, single-family, detached housing units, governed by the development standards under Low Density in the WLSP. WLSP defines Low Density as 3 to 9 dwelling units per net acre with maximum coverage of 50 percent. For the proposed residential uses, four lot sizes are proposed ranging from 3,360 square feet to 5,000 square feet with two different lot frontage widths and three different lot lengths. The following lot dimensions would be provided: 42 feet by 80 feet, 42 feet by 85 feet, 50 feet by 80 feet, and 50 feet by 100 feet.

Parks and Landscaping

The Specific Plan will feature two park areas: a 6.2-acre park near the center of the subdivision, and a 30-foot wide, 4.8-acre linear park around the perimeter where the site is adjacent to the San Joaquin River. In addition, each major road right-of-way will include street trees, which will be a mixture of evergreen and deciduous varieties best suited to the climate, spaced 30 to 40 feet on center. Every residential lot will have a minimum of one street tree. The park spaces will include street trees, accent trees, low water use shrubs and turf. There is also a two-acre parkland dedication south of Towne Center Drive that may or may not be developed as a part of the proposed Project.

Irrigation for the landscaping will be provided as follows:
- Root watering systems for the trees;
- Rotor/rotary for turf; and
- Point source for shrubs.

The Specific Plan includes landscape architectures standards. Landscaping would be provided throughout the Plan Area, such as along roadways, paths, and parks. Tree species with invasive characteristics would be avoided. When selecting plant species, species that would minimize maintenance challenges would be preferred. Evergreen shrubs would be utilized where appropriate for screening of fences or utility structures. A mix of deciduous and evergreen tree varieties would be utilized to create interest throughout the seasons. Traditional “lawn” species would be highly discouraged in parkway strips and should be limited to parks and public open spaces for recreational use. Further, deep rooting species that use less water would be utilized when “lawn” species are used.

Circulation

The Specific Plan will include a network of arterial streets, collector streets, and local streets. The local roads will be designed according to City of Lathrop standards with a 56-foot right-of-way. The one exception would Towne Center Drive, which will have a City standard 80-foot right-of-way width. Existing Towne Centre Drive south of River Islands Parkway will be extended under River Islands Parkway and continue north through the Mossdale West site to Barbara Terry Boulevard. Full frontage improvements will be added to the extension south of River Islands Parkway. Additionally, the scope of the Project includes widening the existing River Islands Parkway and Barbara Terry Boulevard with full frontage improvements where they are adjacent to the site to the ultimate right-of-way widths of 156 feet and 45 feet to 52 feet respectively.

The Specific Plan will include bicycle, pedestrian, and transit facilities. Pedestrian walkways would be provided along all local streets. Class II bike lanes will be provided along the proposed arterial and collector streets. A multi-use trail with a Class I bike path would be provided along the San Joaquin River. Additionally, two bus stops are proposed along Town Centre Drive.

Utilities

Sanitary sewer, water and storm drain systems will be built in the rights-of-way of the proposed streets and will connect to nearby existing systems.

The proposed Project would connect to existing City infrastructure to provide water, sewer, and storm drainage utilities. Existing storm drain, sewer, water, and gas lines/pipes are currently located within the roadways of the adjacent residential uses to the north and west.

The Project would be served by the following existing service providers:

1. City of Lathrop for water;
2. City of Lathrop for wastewater collection and treatment;
3. City of Lathrop for stormwater collection; and
4. Pacific Gas and Electric Company for gas and electricity.

Utility extensions would be installed to provide services to the Project. Utility lines within the Project site and adjacent roadways would be extended throughout the Project site. Wastewater,

water, and storm drainage lines would be connected via existing lines along the various residential roadways adjacent north and west of the site.

The water system for Mossdale Landing West will be designed and constructed according to the City's 2019 Water System Master Plan.

The wastewater system for Mossdale Landing West will be designed and constructed according to the City's 2019 Wastewater System Master Plan. Wastewater from the Mossdale Landing West site will be directed via a gravity system to the existing Mossdale Pump Station, located near the northwest corner of the intersection of River Islands Parkway and McKee Boulevard. From there, it will travel via force main to be treated at the City-owned Lathrop Consolidated Treatment Facility, which is located on S. Howland Road, northeast of the Interstate 5/120 Interchange. Upgrades may be required to the pump station and the downstream system to accommodate wastewater from the Mossdale Landing West site.

According to the Mossdale Landing Master Drainage Plan, the Mossdale Village drainage shed is divided into six sub-sheds with a combined area of 912 acres. Each sub-shed functions independently and has its own pump station, storm water quality basin or vault and flood control detention basin. Underground detention solutions are permitted to be used where appropriate. Each sub-shed is required to treat the first flush storm event, which is the volume of water equal to the 85th percentile of a 24-hour storm event. The pumps will begin to discharge water to a single outfall at the San Joaquin River (up to 30 percent of the peak discharge rate) once the first flush event has been treated. After the rain event is over, the pumps will continue to direct water to the river; however, if the San Joaquin River rises to a base flood level of 21.0 feet, the pumps will shut off until the water level in the river subsides. More information can be obtained from the Drainage Plan.

The storm drain lines in each individual residential street in Mossdale Landing West will drain towards the main line in Towne Centre Drive, which crosses River Islands Parkway and connects to an existing main near the intersection of Village Avenue. Water will then travel via gravity to the existing pump station located in the southwest corner of the Mossdale Landing Community Park, which will eventually pump the water into the San Joaquin River. Upgrades to the existing pump and storm drain system will be determined.

If an interim storm drain solution is required, a temporary detention basin can be constructed near the southern border of the site to hold water until it can be slowly released to enter the existing storm drain system.

In order to meet the requirements of the NPDES General Permit for Stormwater Discharges from Small MS4s, the City has prepared a Stormwater Management Plan and adopted the 2015 Multi-Agency Post-Construction Stormwater Standards Manual. Because it is likely to undergo elevated population growth, the City must also adhere to the supplemental provisions of Attachment 4 of the General Permit, which contains design standards and receiving water restrictions that must be incorporated into the design and installation of infrastructure associated with new development. According to the General Permit, both structural and non-structural Best Management Practices (BMPs) for post-construction must be installed for any new development. Structural BMPs capture and treat the first flush runoff. Examples include grassy swales, stormwater quality basins and underground vaults. To help guarantee the proper continuing operation and maintenance of these

BMPs, operations and maintenance (O&M) manuals and recommended maintenance schedules are required. Examples of non-structural BMPs include good housekeeping and employee training.

Specific Plan

Before establishing a planned development or issuing development or building permits, the WLSP states that a Specific Plan document must be approved and adopted by the City Council. The Specific Plan provides a framework of development and Project implementation for use by the City, developers and builders, which includes street and design standards and guidelines, detailed land uses, infrastructure, site planning, architecture, landscape. The approval of the proposed Specific Plan document satisfies the requirements of the City's Specific Plan process.

Vesting Tentative Map

Also referred to as a Tentative Subdivision Map, a Vesting Tentative Map will be submitted to initiate the process of subdividing the Project site. The Vesting Tentative Map design will be governed by the Subdivision Map Act, the City of Lathrop Subdivision Ordinance, the WLSP, the Specific Plan, and the City's infrastructure master plans. The Vesting Tentative Map will be subject to review by the City's Planning Commission and approval by the Lathrop City Council.

Architectural Design Review

Architectural Design Review is a discretionary permit and will be required at the Final Map stage. The purpose of the Architectural Design Review is to confirm that the proposed plans for the Project are consistent with the policies and guidelines set forth in the WLSP and the proposed Mossdale Landing West Specific Plan. The City requires projects to meet specific standards with respect to architectural styles and signage, landscape and design themes. The Architecture Design Review discretionary permit is subject to review and approval by the City's Community Development Director.

Williamson Act Cancellation

The entire Plan Area falls under the Williamson Act and will require existing contracts to go through the process of cancellation and non-renewal. The Williamson Act cancellation process cannot occur until after the properties are annexed to the City of Lathrop.

Cancellation of the Williamson Act is provided in Sections 51240-51287 of the Government Code. The state law requires those who wish for non-renewal, to file a Notice of Non-Renewal signifying intent to not renew the contract and file a petition for cancellation with the Lathrop City Council. The Lathrop City Council must find that the cancellation is consistent with the purposes of the Williamson Act and furthers public interest to approve the cancellation. Once approved, the land may continue to be used for agricultural purposes up until the development of land requires discontinuation.

General Plan Land Use Designations and Zoning

The Plan Area is designated as Low Density Residential (LD) by the City's General Plan Land Use Map and is zoned as RL-MV (Low Density Residential, Mossdale Village Combining District) and P-MV (Public Schools Parks Open Space, Mossdale Village Combining District) by the City's Zoning Map.

General Plan Amendment

The proposed Project will include a General Plan Amendment from LD to LD, Park (P), and Open Space (O).

Rezone

The proposed Project will include a rezone from RL-MV and P-MV to RL-MV, P-MV (Park, Mossdale Village Combining District), and OS-MV (Open Space, Mossdale Village Combining District).

Uses of the EIR and Required Agency Approvals

This EIR may be used for the following direct and indirect approvals and permits associated with adoption and implementation of the proposed Project.

City of Lathrop

The City of Lathrop will be the Lead Agency for the proposed Project, pursuant to the State Guidelines for Implementation of CEQA, Section 15050.

If the City Council certifies the EIR in accordance with CEQA requirements, the City may use the EIR to support the following actions:

- Certification of the EIR;
- Adoption of the Mitigation Monitoring and Reporting Program;
- A General Plan Amendment to update the City of Lathrop General Plan designation from LD to LD, P and O;
- A rezone from RL-MV and P-MV to RL-MV, P-MV, and OS-MV;
- A Specific Plan approval;
- Approval of a Code Text Amendment to the Lathrop Municipal Code;
- A Vesting Tentative Map approval;
- An updated Urban Design Concept;
    - Williamson Act cancellation;
    - Approval of development agreement between the applicant and the City;

- Improvement plan approval; and
- Project CEQA approval.

Other Governmental Agency Approvals

The following agencies may be required to issue permits or approve certain aspects of the proposed Project. Other governmental agencies that may require approvals in connection with the Project include, but are not limited to, the following:

- Regional Water Quality Control Board (RWQCB) – Construction activities would be required to be covered under the National Pollution Discharge Elimination System (NPDES);
- RWQCB – The Storm Water Pollution Prevention Plan (SWPPP) would be required to be approved prior to construction activities pursuant to the Clean Water Act;
- San Joaquin Valley Air Pollution Control District (SJVAPCD) – Construction activities would be subject to the SJVAPCD codes and requirements.

REGULATORY CONTEXT

State historic preservation regulations affecting this project include the statutes and guidelines contained in the California Environmental Quality Act (CEQA; Public Resources Code sections 21083.2 and 21084.1 and sections 15064.5 and 15126.4 (b) of the CEQA Guidelines). CEQA Section 15064.5 requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. Public Resources Code Section 21098.1 further cites: A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.

An "historical resource" includes, but is not limited to, any object, building, structure, site, area, place, record or manuscript that is historically or archaeologically significant (Public Resources Code section 5020.1).

Advice on procedures to identify such resources, evaluate their importance, and estimate potential effects is given in several agency publications such as the series produced by the Governor's Office of Planning and Research (OPR), *CEQA and Archaeological Resources,* 1994. The technical advice series produced by OPR strongly recommends that Native American concerns and the concerns of other interested persons and corporate entities, including, but not limited to, museums, historical commissions, associations and societies be solicited as part of the process of cultural resources inventory. In addition, California law protects Native American burials, skeletal remains, and associated grave goods regardless of the antiquity and provides for the sensitive treatment and disposition of those remains (California Health and Safety Code Section 7050.5, California Public Resources Codes Sections 5097.94 et al).

The California Register of Historical Resources (Public Resources Code Section 5020 et seq.)

The State Historic Preservation Office (SHPO) maintains the California Register of Historical Resources (CRHR). Properties listed, or formally designated as eligible for listing, on the National Register of Historic Places are automatically listed on the CRHR, as are State Landmarks and Points of Interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

For the purposes of CEQA, an historical resource is a resource listed in, or determined eligible for listing in the California Register of Historical Resources. When a project will impact a site, it needs to be determined whether the site is an historical resource. The criteria are set forth in Section 15064.5(a) (3) of the CEQA Guidelines, and are defined as any resource that does any of the following:

A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B. Is associated with the lives of persons important in our past;

C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

D. Has yielded, or may be likely to yield, information important in prehistory or history.

In addition, the CEQA Guidelines, Section 15064.5(a) (4) states:

The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code section 5020.1(j) or 5024.1.

California Health and Safety Code Sections 7050.5, 7051, and 7054

These sections collectively address the illegality of interference with human burial remains, as well as the disposition of Native American burials in archaeological sites. The law protects such remains from disturbance, vandalism, or inadvertent destruction, and establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project, including the treatment of remains prior to, during, and after evaluation, and reburial procedures.

California Public Resources Code Section 15064.5(e)

This law addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction. The section establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project and establishes the Native American Heritage Commission as the entity responsible to resolve disputes regarding the disposition of such remains.

Assembly Bill 52

Assembly Bill (AB) 52 establishes a formal consultation process for California tribes as part of CEQA and equates significant impacts on tribal cultural resources with significant environmental impacts. AB 52 defines a "California Native American Tribe" as a Native American tribe located in California that is on the contact list maintained by the Native American Heritage Commission. AB 52 requires formal consultation with California Native American Tribes prior to determining the level of environmental document if a tribe has requested to be informed by the lead agency of proposed projects.

AB 52 also requires that consultation address project alternatives, mitigation measures, for significant effects, if requested by the California Native American Tribe, and that consultation be considered concluded when either the parties agree to measures to mitigate or avoid a significant effect, or the agency concludes that mutual agreement cannot be reached. Under AB 52, such measures shall be recommended for inclusion in the environmental document and adopted mitigation monitoring program if determined to avoid or lessen a significant impact on a tribal cultural resource.

CULTURAL SETTING

Prehistory

The Central Valley region was among the first in the state to attract intensive fieldwork, and research has continued to the present day. This has resulted in a substantial accumulation of data. In the early decades of the 1900s, E.J. Dawson explored numerous sites near Stockton and Lodi, later collaborating with W.E. Schenck (Schenck and Dawson 1929). By 1933, the focus of work was directed to the Cosumnes locality, where survey and excavation studies were conducted by the Sacramento Junior College (Lillard and Purves 1936). Excavation data, in particular from the stratified Windmiller site (CA-Sac-107), suggested two temporally distinct cultural traditions. Later work at other mounds by Sacramento Junior College and the University of California, Berkeley, enabled the investigators to identify a third cultural tradition, intermediate between the previously postulated Early and Late Horizons.

The three-horizon sequence, based on discrete changes in ornamental artifacts and mortuary practices, as well as on observed differences in soils within sites (Lillard, Heizer and Fenenga 1939), was later refined by Beardsley (1954). An expanded definition of artifacts diagnostic of each time period was developed, and its application extended to parts of the central California coast. Traits held in common allow the application of this system within certain limits of time and space to other areas of prehistoric central California.

The Windmiller Culture (Early Horizon) is characterized by ventrally-extended burials (some dorsal extensions are known), with westerly orientation of heads; a high percentage of burials with grave goods; frequent presence of red ocher in graves; large projectile points, of which 60 percent are of materials other than obsidian; rectangular *Haliotis* beads; *Olivella* shell beads (types A1a and L); rare use of bone; some use of baked clay objects; and well-fashioned charmstones, usually perforated.

The Cosumnes Culture (Middle Horizon) displays considerable changes from the preceding cultural expression. The burial mode is predominately flexed, with variable cardinal orientation and some cremations present. There are a lower percentage of burials with grave goods, and ocher staining is common in graves. *Olivella* beads of types C1, F and G predominate, and there is abundant use of green *Haliotis* sp. rather than red *Haliotis* sp. Other characteristic artifacts include perforated and canid teeth; asymmetrical and "fishtail" charmstones, usually unperforated; cobble mortars and evidence of wooden mortars; extensive use of bone for tools and ornaments; large projectile points, with considerable use of rock other than obsidian; and use of baked clay.

Hotchkiss Culture (Late Horizon) -- The burial pattern retains the use of the flexed mode, and there is wide spread evidence of cremation, lesser use of red ocher, heavy use of baked clay, *Olivella* beads of Types E and M, extensive use of *Haliotis* ornaments of many elaborate shapes and forms, shaped mortars and cylindrical pestles, bird-bone tubes with elaborate geometric designs, clam shell disc beads, small projectile points indicative of the introduction of the bow and arrow, flanged tubular pipes of steatite and schist, and use of magnesite (Moratto 1984:181-183). The characteristics noted are not all-inclusive, but cover the more important traits.

Schulz (1981), in an extensive examination of the central California evidence for the use of acorns, used the terms Early, Middle and Late Complexes, but the traits attributed to them remain generally the same. While it is not altogether clear, Schulz seemingly uses the term "Complex" to refer to the particular archeological entities (above called "Horizons") as defined in this region. Ragir's (1972) cultures are the same as Schulz's complexes.

Bennyhoff and Hughes (1984) have presented alternative dating schemes for the Central California Archeological Sequence. The primary emphasis is a more elaborate division of the horizons to reflect what is seen as cultural/temporal changes within the three horizons and a compression of the temporal span.

There have been other chronologies proposed, including Fredrickson (1973), and since it is correlated with Bennyhoff's (1977) work, it does merit discussion. The particular archeological cultural entities Fredrickson has defined, based upon the work of Bennyhoff, are patterns, phases and aspects. Bennyhoff's (1977) work in the Plains Miwok area is the best definition of the Cosumnes District, which likely conforms to Fredrickson's pattern. Fredrickson also proposed periods of time associated heavily with economic modes, which provides a temporal term for comparing contemporary cultural entities. It corresponds with Willey and Phillips' (1958) earlier "tradition", although it is tied more specifically to the archeological record in California.

Ethnography

The Plan Area lies within the northern portion of the ethnographic territory of the Yokuts people. The Yokuts were members of the Penutian language family which held all of the Central Valley, San Francisco Bay Area, and the Pacific Coast from Marin County to near Point Sur. The Yokuts differed from other ethnographic groups in California as they had true tribal divisions with group names (Kroeber 1925; Latta 1949). Each tribe spoke a particular dialect, common to its members, but similar enough to other Yokuts that they were mutually intelligible (Kroeber 1925).

The Yokuts held portions of the San Joaquin Valley from the Tehachapi mountains in the south to Stockton in the north. On the north they were bordered by the Plains Miwok, and on the west by the Saclan or Bay Miwok and Ohlone peoples. Although neighbors were often from distinct language families, differences between the people appear to have been more influenced by environmental factors as opposed to linguistic affinities. Thus, the Plains Miwok were more similar to the nearby Yokuts than to foothill members of their own language group. Similarities in cultural inventory co-varied with distance from other groups and proximity to culturally diverse people. The material culture of the southern San Joaquin Yokuts was therefore more closely related to that of their non-Yokuts neighbors than to that of Delta members of their own language group.

Trade was well developed, with mutually beneficial interchange of needed or desired goods. Obsidian, rare in the San Joaquin Valley, was obtained by trade with Paiute and Shoshoni groups on the eastern side of the Sierra Nevada, where numerous sources of this material are located, and to some extent from the Napa Valley to the north. Shell beads, obtained by the Yokuts from coastal people, and acorns, rare in the Great Basin, were among many items exported to the east by Yokuts traders (Davis 1961).

Economic subsistence was based on the acorn, with substantial dependency on gathering and processing of wild seeds and other vegetable foods. The rivers, streams, and sloughs that formed a maze within the valley provided abundant food resources such as fish, shellfish, and turtles. Game, wild fowl, and small mammals were trapped and hunted to provide protein augmentation of the diet. In general, the eastern portion of the San Joaquin Valley provided a lush environment of varied food resources, with the estimated large population centers reflecting this abundance (Cook 1955; Baumhoff 1963).

Settlements were oriented along the water ways, with their village sites normally placed adjacent to these features for their nearby water and food resources. House structures varied in size and shape (Latta 1949; Kroeber 1925), with most constructed from the readily available tules found in the extensive marshes of the low-lying valley areas. The housepit depressions for the structures ranged in diameter from 3 meters to 18 meters (Wallace 1978:470).

Regional Historical Background

The northern section of the City of Lathrop lies on a portion of the Rancho Campo de los Franceses, the ranch named for the early camp first occupied by French-Canadian trappers employed by the Hudson's Bay Company in 1832. The site of the present-day location of French Camp was the terminus of the Oregon Trail used by the trappers between 1832 and 1845. In 1843, William Gulnac, likely one of the trappers who had become a Mexican citizen, with Charles Weber, later founder of Stockton, organized a company of 12 men for the purpose of forming a colony at French Camp. Gulnac filed for a land grant, and was awarded a large tract of land including French Camp and the later site of Stockton by the Mexican government.

Much of the remainder of the land is a portion of the El Pescadero land grant. The Mexican land grant of 35,546 acres, lying in portions of what is now San Joaquin and Alameda counties, was awarded in 1843 to Antonio Maria Pico. Pico sold one half of the property to Henry Morris Naglee in 1849. Pico sold one half of the remainder of the property in 1852 to John C. Frémont. After California became a state, a claim was filed for the grant in 1852 and rejected in 1854, but ultimately the land grant was patented to Pico and Naglee in 1865. The land grant was settled by numerous squatters, and Fremont sold his land to Charles McLaughlin in 1867.

Lathrop first was a station on the Central Pacific, established in 1869 when the last stretch of the transcontinental railroad was built from Sacramento through this region, crossing the San Joaquin River at Mossdale to reach the Bay Area.

The site of Lathrop was first known as Wilson's Station, and included a store and a schoolhouse on land belonging to Thomas A. Wilson. Due to conflicts in the City of Stockton that infuriated Leland Stanford, the Central Pacific Railroad switched many operations to Wilson's Station, later re-named for Charles Lathrop, brother-in-law of Leland Stanford. The town drew significant commerce away from the City of Stockton. The railroad's machine shops and roundhouse were built here, and the town became an important division point and major stop on the railroad line beginning in 1871. The Visalia Division of the Stockton Branch of the Southern Pacific Railroad was completed at that time, serving the San Joaquin Valley. Lathrop became an important shipping point for agricultural products.

The early major building in Lathrop was the 1871 Central Pacific Railroad restaurant, serving passengers from trains from the Bay Area to Sacramento, and passengers travelling to the San Joaquin Valley. After he physically struck United States Supreme Court Justice Stephen Field in 1889 in the Central Pacific restaurant, attorney David S. Terry was shot and killed by Field's bodyguard.

Lathrop remained important for the railroads, and in 1890, had about 500 residents. Daily, there were twelve passenger and 44 freight trains passing through. But that changed in the early 1890s with the growth of Tracy, and the transfer of the machine shop and roundhouse to that community. The completion of the Western Pacific railroad in 1909 did not affect the town, with the local station located about ¾ miles from the town.

In 1942, the Lathrop Holding and Reconsignment Point was established in the Lathrop vicinity on what had been a sheep ranch, holding supplies for shipment through Bay Area ports. As many as

450 railroad cars would be loaded and unloaded each day.

The facility has gone through many changes with the changing needs of the military during times of conflict. After the end of World War II, the depot went through administrative and supply mission changes, the government applied a new name in 1948: Sharpe General Depot. The conflict in Korea brought a demand for increased services as the staffing, shipments and missions doubled during the three years of the war. The Army curtailed supply operations, and the Sharpe site began providing medical supplies and subsistence items on a larger scale. In 1962, the facility became the Sharpe Army Depot.

In 1965, with the escalation of the war in Vietnam, Sharpe became the major conduit for supplies moving to Southeast Asia. The Sharpe facility has continued to operate with a large part of the staffing switched to the Tracy facility beginning in 1999.

In the 1950s, several industrial plants were built in the Lathrop area, providing additional employment in the region. Beginning in the 1980s, improvements to community infrastructure and the attractive pricing of homes brought even more growth. The pattern of rapid growth continues to this day, with industrial and commercial development in the area, as well as many residents commuting daily to the Bay Area. The City of Lathrop incorporated in 1989.

Site Specific History

The earliest settlement of the Plan Area appears to have been by Jacob Wright Harlan, who arrived in the region in September 1853 after driving cattle for Omaha. Harlan built a house and established an orchard. Shortly after this, Harlan traded his land claim with Garnet and another man, giving them $2500 in cattle, with the two men also conveying to Harlan the undivided one-half interest in the Slocum Ferry. By 1888, when Harlan wrote about his experiences, he said by that date, it was named Johnson's Ferry. For Harlan, the ferry was paying well, so in 1856, bought the other one-half interest in the ferry. Part of one of the deals included an eight-room two-story house. Harlan ran the ferry for three more years, then sold the San Joaquin property to B.F.M. Packard and J. Saynor for $11,000. The 1860 federal census shows Benjamin Packard employed as a "ferryman." Two years later, William B. Johnson bought the ferry, and his name retained for it until recent years (Site record, P-39-4602confidential appendix).

William B. Johnson, who eventually owned virtually all the lands of the Plan Area. He chose to have a biography printed in the 1890 County History, so much is known about his life.

Johnson was born in 1812 in Kentucky, and in 1830, he went to Louisiana. A year later he went to Missouri and continued working in agriculture until the lure of gold took him to California in 1849. He mined in the Mariposa region, then went to mine at Washington Flats on the Merced region. After making $1200, he went back east to buy cattle through Nicaragua. He remained in the east for a year, but eventually picked up a drove of 500 cattle, bringing them to San Joaquin County. In the spring of 1852, he and his partner again went east and brought another drove of cattle. Johnson also brought cattle from Los Angeles, becoming very successful. He continued to engage in the cattle trade. He bought an initial tract of land consisting of between 600 and 700 acres in 1862, where he built his home. He added more land to the ranch, and by 1890, had a tract of 1440 acres along the San Joaquin River, with other lands to the north, a ranch of 1,440 acres. In 1889 he sold a tract of land on Union Island of 317 acres. He also owned 3,500 acres of land in Fresno County, part in cultivation and part used for grazing.

Johnson's land had a house on it when he purchased the land; the frame of which had been brought to California around Cape Horn in about 1850. This must be the home for the various early owners. Johnson added to the existing house, and the early house remained part of the complex.

His house appears to have been located on the south side of Johnson Ferry Road, in the vicinity of the location of the Silveira residence, comparing the 1879 mapped location (Thompson and West 1879) with the location of the site recorded with the 1920s building.

Johnson had not only a huge acreage of land, but also had other properties including some business blocks in the city of Stockton and was a stockholder in the San Joaquin Valley Bank (Lewis Publishing Company 1890).

Johnson never married, but in 1874, he adopted a five-year-old girl, Mary Eliza Strahn. The article identified the new father William Johnson as the owner of Johnson's Ferry (*Stockton Daily Independent* 9 July, 1874).

Johnson's Ferry seems to have been a more minor part of Johnson's enterprises. River Island Parkway follows the route of Johnson's Ferry Road. Johnson acquired the Slocum Ferry that crossed the San Joaquin River at the crossing of the River Island Parkway bridge. Johnson maintained the ferry from 1865, or possibly earlier to at least the mid-1870s. Moss had a ferry crossing at Mossdale, and the two men made several deals with Moss promising to stop his ferry business for a fee (Davis 1991).

The adopted daughter was married in 1888 to Martin Howell. After the death of Johnson in January 1891, she was the only heir to a million-dollar estate. There were numerous legal issues, including the inability to find the will, and some questioning the validity of the adoption. In 1895, the property including the project area was shown as owned by Budd, Nutter and Johnson. In 1911, the land was owned by the Stockton Savings Bank.

In about 1920, a 230-acre tract of land was acquired by Joaquin Silveira, a banker from Oakland. His hobby was dairy ranching. The family stayed at the ranch on occasion. The existing large white building was reportedly completed in 1929. In 2006, his son owned the property, and provided information on the Silveira family to Vicki Beard.

RECORD SEARCH

A record search was conducted for the current APE and a 0.25-mile radius at the Central California Information Center of the California Historical Resources Information System on August 8, 2022 (Record Search File No.: 12266L; Appendix 2).

Portions of the Project area have been surveyed in the past, first by Origer and Associates in 2007. Four sites are reported within the Project area: two isolated prehistoric period artifacts (P-39-004345 and P-39-004347), one isolated historic period glass fragment (P-39-004346), and the 1929 Silveira residential complex (P-39-004602). The site form is included in the Confidential Appendix.

The building complex, P-39-004602, was evaluated as not eligible for the National Register, first by Beard and followed by Section 106 consensus (SHPO file USCG060605A, SHPO letter of January 26, 2007, Confidential Appendix). This action is followed by a survey by AECOM of the area along the RD 17 levee (AECOM 2010, 2014) with apparently no further sites found.

GEI Consultants Inc. monitored the levee construction work. No archeological resources were found, nor was a report prepared to document the monitoring effort.

FIELD ASSESSMENT

Michael Lawson (resume, Appendix 1) completed a field survey of a portion of the Plan Area on September 14, 2022.

The Reclamation District (RD) 17 levee work was underway when he first visited the property. The construction yard for the project had been set up within the boundaries of P-39-0004602. The Plan Area was under cultivation for tomatoes. The construction team leader informed him that a GEI archeologist was monitoring the construction.

The survey area is mostly leveled agricultural fields protected from the adjacent San Joaquin River to the south, west and north by an 18' tall earthen levee. Subdivisions are located adjacent to the northern and eastern boundaries.

River Island Parkway runs adjacent to the east boundary with an over-crossing at the southeast section. The location of the former historical Johnson's Ferry is at this point and comprises the southeastern tip of the survey area. Several older buildings remain, including two barns, a two-story house, and a shed (recorded as P-39-004602).

At time of our initial survey effort, a major levee improvement project for RD 17 was underway, with heavy equipment removing soil from levee, reinforcing the base, and then importing more soil to raise the elevation. The toe of the levee appeared to be widened, extending slightly into the farm complex and possibly the field area as well. Construction equipment as well as a contractor trailer and storage units were present near the two-story house. The levee work had been completed before our final field effort in 2023.

The sediments within the agricultural area are primarily silty loam, light brown in color, uniformly distributed across all fields. There is a modest content of rounded alluvial pebbles likely associated with the adjacent river. Areas excavated to a depth of up to 2' for irrigation placement revealed the same soil constituents and color.

The soil of the farm building complex is light to medium brown sandy to silty loam with rounded alluvial pebbles and imported road gravel, cobbles. Around barns and likely locations of animal pens, the soil is slightly more organic and darker in color and with a higher fraction of compaction and disturbance.

The first survey effort was minimal after finding the levee work underway and a tomato crop still growing over much of the land acreage. The survey efforts were conducted after the fall crop harvest and the fields were mostly bare, tilled and fallow. Typical invasive and indigenous weeds and plants such as wild radish, datura, goats-head, brome and Russian thistle were present around the perimeter of the fiends and along edges of dirt access roads. Native valley oaks were present in several places at property boundaries and near the farm complex. Ornamental imported trees stand near the barns and house.

The ground visibility was excellent in both agricultural fields and within the farm complex due to seasonal harvest and tilling, and scraping for levee toe construction.

Due to known historical and prehistoric occupation within or nearby the project area, complete intensive investigation was conducted using parallel transects not greater in width than 3-5 meters within the entire building complex segment and within 100' of the levee in the crop fields. For the remainder of the fields general survey method of parallel transects no greater than 10-15 meters in width was used.

No cultural resources were observed within the crop field sections, and within farm building complex site area, less than ten fragments of historical refuse were identified including green glass, aqua glass, window glass, baling wire and one small cut nail.

SURVEY RESULTS

No prehistoric period resources were found within the boundaries of the Plan Area. The previously recorded building complex, P-39-004602, has been formally determined to be "not significant" by the State Office of Historic Preservation.

The previous researchers made no attempt to look at historic maps and sources that provide so much information on the use and occupancy of the site. Part of our ability to look at more sources is improved technology and access to records and historical sources.

It has been concluded by the State Office of Historic Preservation that the 1929 Silveira house and adjacent buildings themselves are not eligible for the National Register or California Register (Appendix 2). But it is possible other sites are present.

Prehistoric Period Sites

Water crossings throughout northern and central California are historically located on high spots, allowing a safe crossing for ferries and bridges. These high spots have proven to be the locations of prehistoric sites, at one or both ends of the bridge or ferry landings. At this property, there is a higher elevation that could be a prehistoric period site. Apparently, nothing was found when the bridge was installed for River Island Parkway, but it is possible that a site could exist and it is unknown. Finding cultural materials could provide information important to understanding the prehistoric occupancy of the property.

Historic Period Resources

Portions of the Plan Area became the eastern half of a commercial ferry business very early in the 1850s. An early house was also present in association, that eventually become part of a larger home. Deposits related to the early occupancy of the property could provide additional information on the lifeways of the early residents. There may be deposits related to the later historic use of the property by William Johnson and successor owners.

RECOMMENDATIONS

The southern portion of the Plan Area lies at the location of "Johnson's Ferry." There is clearly a higher point in the Plan Area that could have been a prehistoric period site. Although no site was found by the AECOM survey of the current survey, it is possible that historic period activities, including residential construction may have covered the remnants of a prehistoric site. Three prehistoric period artifacts were all found nearby. We advise that an archeologist be present for the demolition and earth-moving activities at the site of the residence, to check for the presence of any prehistoric period artifacts or deposit. The findings my require additional studies, and the Native American community will be contacted to view the findings and help develop a plan for further work. A map is enclosed in a confidential appendix showing the area we believe needs to monitored during building removal, and includes the site record for P-39-00602.

Although no prehistoric sites were found during the survey, there is a slight possibility that a site may exist and be totally obscured by vegetation, fill, or other historic activities, leaving no surface evidence. Should artifacts or unusual amounts of stone, bone, or shell be uncovered during construction activities, work in that part of the Plan Area shall be halted, and an archeologist should be consulted for on-the-spot evaluation of the finding.

Discovery of Human Remains

In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area suspected to overlie adjacent remains until the San Joaquin County Coroner has determined that the remains are not subject to any provisions of law concerning investigation of the circumstances, manner and cause of death, and the recommendations concerning the treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative. The coroner shall make his or her determination within two working days from the time the person responsible for the excavation, or his or her authorized representative, notifies the coroner of the discovery or recognition of the human remains.

If the San Joaquin County Coroner determines that the remains are not subject to his or her authority and if the Coroner recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission (NAHC).

After notification, the NAHC will follow the procedures outlined in Public Resources Code Section 5097.98, that include notification of most likely descendants (MLDs), and recommendations for treatment of the remains. The MLDs will have 48 hours after notification by the NAHC to make their recommendations (PRC Section 5097.98).

REFERENCES

AECOM

2011 Phase 3 RD 17 100-Year Levee Seepage Area Project. On file, Central California Information Center.

2014 Addendum Cultural Resources Inventory Report, Phase 3 RD 17 100-Year Levee Seepage Area Project. On file, Central California Information Center.

Baumhoff, Martin A.

1963 Ecological Determinants of Aboriginal California Populations. *University of California Publications in American Archaeology and Ethnology* 49(2):155-236. Berkeley.

Beard, Vicki

2007 *Historic Resources Evaluation for the Bradshaw's Crossing Bridge Near Lathrop San Joaquin County.* Tom Origer and Associates. On file, Central California Information Center.

Beardsley, Richard K.

1954 Temporal and Areal Relationships in Central California Archeology (parts 1 and 11). *University of California Archaeological Survey Reports* 24, 25. Berkeley.

Bennyhoff, James A.

1977 Ethnogeography of the Plains Miwok. *Center for Archaeological Research at Davis, Publications* 5. University of California, Davis.

Bennyhoff, James A. and Robert F. Heizer

1958 Cross-Dating Great Basin Sites by Californian Shell Beads. *University of California Archaeological Survey Report*, 42:60-92. Berkeley.

Cook, Sherburne F.

1955 The Aboriginal Populations of the San Joaquin Valley, California. *University of California Anthropological Records* 16(2). Berkeley.

Davis, James T.

1961 Trade Routes and Economic Exchange among the Indians of California. *University of California Archaeological Survey Reports* 54:1-71. Berkeley.

Davis, Olive

1991 From the Ohio to the San Joaquin: A biography of William Moss, 1798-1883. Heritage West Publications, Stockton.

Fickewirth, Alvin A.

1992 *California Railroads*. Golden West Books, San Marino.

Fredrickson, David A.
1973 *Early Cultures of the North Coast Ranges, California*. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Davis.

Gudde, Erwin
1969 *California Place Names*. University of California Press, Berkeley.

Hoover, Mildred, Hero E. Rensch, Ethel G. Rensch and William N. Abeloe
1990 *Historic Spots in California* (Fourth Edition), revised by Douglas E. Kyle. Stanford University Press, Stanford.

Kroeber, Alfred L.
1953 *Handbook of the California Indians*. California Book Company, Ltd., Berkeley.

Latta, F. F.
1949 *Handbook of the Yokuts Indians*. Bear State Books, Oildale, California.

Lewis Publishing Company
1890 *An Illustrated History of San Joaquin County.*, Chicago: Lewis Publishing Company.

Lillard, Jeremiah B., Robert F. Heizer and Franklin Fenenga
1939 An Introduction to the Archaeology of Central California. *Sacramento Junior College, Department of Anthropology Bulletin* 2. Sacramento.

Lillard, Jeremiah B. and William K. Purves
1936 The Archeology of the Deer Creek-Cosumnes Area, Sacramento County, California. *Sacramento Junior College, Department of Anthropology Bulletin* 1. Sacramento.

Moratto, Michael J.
1984 *California Archaeology*. Academic Press, New York.

Ragir, Sonia
1972 The Early Horizon in Central California Prehistory. *University of California Research Contributions* 15. Berkeley.

Rosenthal, Jeffery S., and Jack Meyer
2004 Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways, Volume III: Geoarchaeological Study Landscape Evolution and the Archaeological Record of Central California. On file, Central California Information Center, California State University, Stanislaus.

Schenck, W. Egbert and Elmer Dawson
1929 Archaeology of the Northern San Joaquin Valley. *University of California*

Publications in American Archaeology and Ethnology 25(4):289-413. Berkeley.

Schulz, Peter D.
1981 *Osteoarchaeology and Subsistence Change in Prehistoric Central California*. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Davis.

Smith, Wallace
1960 *Garden of the Sun*. Privately printed.

Thompson and West
1879 *History of San Joaquin County, California, with Illustrations*. Oakland, Thompson &West. Reprinted in 1968 by Howell-North Books, Berkeley.

Wallace, William J.
1978 Northern Valley Yokuts. In *California*, edited by Robert F. Heizer, pp. 462-470. Handbook of North American Indians, vol. 8, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Willey, Gordon R. and Phillip Phillips
1958 *Method and Theory in American Archaeology*. The University of Chicago Press, Chicago.

APPENDIX 1

Resumes

PEAK & ASSOCIATES, INC.
RESUME

MELINDA A. PEAK **January 2024**
Senior Historian/Archeologist
3941 Park Drive, Suite 20 #329
El Dorado Hills, CA 95762
(916) 939-2405

PROFESSIONAL EXPERIENCE

Ms. Peak has served as the principal investigator on a wide range of prehistoric and historic excavations throughout California. She has directed laboratory analyses of archeological materials, including the historic period. She has also conducted a wide variety of cultural resource assessments in California, including documentary research, field survey, Native American consultation and report preparation.

In addition, Ms. Peak has developed a second field of expertise in applied history, specializing in site-specific research for historic period resources. She is a registered professional historian and has completed a number of historical research projects for a wide variety of site types.

Through her education and experience, Ms. Peak meets the Secretary of Interior Standards for historian, architectural historian, prehistoric archeologist and historic archeologist.

EDUCATION

M.A. - History - California State University, Sacramento, 1989
Thesis: *The Bellevue Mine: A Historical Resources Management Site Study in Plumas and Sierra Counties, California*
B.A. - Anthropology - University of California, Berkeley

PROJECTS

In recent years, Ms. Peak has led the team completing the cultural resource sections for General Plan and General Plan Updates, for a number of cities/neighborhoods including Campbell, Milpitas, Yountville, Manteca, The Springs, Sebastopol, Martinez, Brentwood, Colusa County and Foster City. Older General Plan efforts include Wheatland, Rocklin, Sheridan, Granite Bay and South Sutter County.

In recent months, Ms. Peak has completed a number of determinations of eligibility and effect documents in coordination with the Corps of Engineers for projects requiring federal permits, assessing the eligibility of a number of sites for the National Register of Historic Places.

She has also completed historical research and historic site evaluation projects on a wide variety of topics for a number of projects including the development of a winery in a ranch in Folsom, commercial buildings in the City of Davis, a lumber mill in Clovis, levees, warehouses, older farmhouses dating to the 1860s, an early roadhouse, bridges, canals, a former small-town site, and a section of an electric railway line.

In recent years, Ms. Peak has prepared a number of cultural resource overviews and predictive models for blocks of land proposed for future development for general and specific plans. She has been able to direct a number of surveys of these areas, allowing the model to be tested.

Ms. Peak completed the cultural resource research and contributed to the text prepared for the DeSabla-Centerville PAD for the initial stage of the FERC relicensing. She also served cultural resource project manager for the FERC relicensing of the Beardsley-Donnells Project. For the South Feather Power Project and the Woodleaf-Palermo and Sly Creek Transmission Lines, her team completing the technical work for the project.

She served as principal investigator for the multi-phase Twelve Bridges Golf Club project in Placer County. She served as liaison with the various agencies, helped prepare the historic properties treatment plan, managed the various phases of test and data recovery excavations, and completed the final report on the analysis of the test phase excavations of a number of prehistoric sites.

Ms. Peak has served as project manager for a number of major survey and excavation projects in recent years, including the many surveys and site definition excavations for the 172-mile-long Pacific Pipeline proposed for construction in Santa Barbara, Ventura and Los Angeles counties. She also completed an archival study in the City of Los Angeles for the project, and served as principal investigator for a major coaxial cable removal project for AT&T.

Additionally, she completed a number of small surveys, served as a construction monitor at several urban sites, and conducted emergency recovery excavations for sites found during monitoring. She has directed the excavations of several historic complexes in Sacramento, Placer and El Dorado Counties.

Ms. Peak is the author of a chapter and two sections of a published history (1999) of Sacramento County, *Sacramento: Gold Rush Legacy, Metropolitan Destiny*. She served as the consultant for a children's book on California, published by Capstone Press in 2003 in the Land of Liberty series.

PEAK & ASSOCIATES, INC.
RESUME

MICHAEL LAWSON **January 2024**
Archeological Specialist
3941 Park Drive, Suite 20-329
El Dorado Hills, CA 95672
(916) 939-2405

PROFESSIONAL EXPERIENCE
Mr. Lawson has compiled an excellent record of supervision of excavation and survey projects for both the public and private sectors over the past twenty-six years. He has conducted a number of surveys throughout northern and central California, as well as serving as an archeological technician and crew chief for a number of excavation projects.

EDUCATION
B.A. - Anthropology - California State University, Sacramento

Special Course: Comparative Osteology. University of Tennessee, Knoxville. Forensic Anthropology Center. January 2018.

Intensive lab and outdoor study with human example from outdoor research facility, including typical and non-metric examples, compared with fifty non-human species most commonly confused with human remains. Outdoor research facility “The Body Farm” study included survey, photography, collection and identification of faunal and human bone fragments, with a Power Point presentation discussing finds.

EXPERIENCE
- Extensive monitoring of open space, streets and project development areas for prehistoric period and historic period resources. Areas monitored include Sutter Street in Folsom; Mud Creek Archeological District in Chico; Camp Roberts, San Luis Obispo County; Avila Beach, San Luis Obispo County; Edgewood Golf Course, South Lake Tahoe; Davis Water Project, Davis; Star Bend levee section, Sutter County; Feather River levees, Sutter County; Bodega Bay, Sonoma County; San Jose BART line extension, Santa Clara County; and numerous sites for PG&E in San Francisco.
- Over twenty years of experience working in CRM, volunteer, and academic settings in California historic, proto-historic, and prehistoric archaeology.
- Expertise in pedestrian survey, excavation, feature (including burial) exposure, laboratory techniques, research. Field positions include crew chief and lead technician.

APPENDIX 2

Record Search

CENTRAL CALIFORNIA INFORMATION CENTER

California Historical Resources Information System

Department of Anthropology – California State University, Stanislaus
One University Circle, Turlock, California 95382
(209) 667-3307

Alpine, Calaveras, Mariposa, Merced, San Joaquin, Stanislaus & Tuolumne Counties

Date: 8/8/2022

Records Search File No.: 12266L
Access Agreement: #137
Project: Mossdale West

Robert Gerry
Peak & Associates, Inc.
3941 Park Drive, Ste 30-329
El Dorado Hills, CA 95762
916-939-2405/916-283-5238 peakinc@surewest2.net

Invoice to: peakinc@surewest.net

Dear Mr. Gerry:

The Central California Information Center received your record search request for the project area/radius referenced above, located on the Lathrop 7.5' quadrangle in San Joaquin County. The following reflects the results of the records search for the project study area and radius:

As per data currently available at the CCaIC, the locations of resources/reports are provided in the following format: ☒ custom GIS maps ☐ GIS Data/shape files ☐ hand-drawn maps

Summary Data:

Resources within the project area:	4: P-39-004345, 4346, 4347, 4602
Resources within the 1/4-mile radius:	7: P-39-002339, 4340, 4341, 4342, 4343, 4857, 5086
Reports within the project area:	11: SJ-04501, 4807, 5003, 6447, 7472, 6473, 6643, 6723, 6724, 7307, 7465
Reports within the 1/4-mile radius:	12: SJ-00786, 2391, 3247, 3251, 3294, 4383, 6261, 6577, 6579, 6625, 6757, 7293

Resource Database Printout (list):	☒ enclosed	☐ not requested	☒ nothing listed
Resource Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Resource Digital Database Records:	☐ enclosed	☒ not requested	☐ nothing listed
Report Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Report Digital Database Records:	☐ enclosed	☒ not requested	☐ nothing listed
Resource Record Copies:	☒ enclosed	☐ not requested	☐ nothing listed
Report Copies:	☒ enclosed	☐ not requested	☐ nothing listed

OHP Historic Properties Directory: New Excel File: Built Environment Resource Directory (BERD) Dated 11/17/2021
Not all resources listed in the BERD are mapped in GIS, nor do we have records on file for; if you identify additional resources in the BERD that you need copies of, contact the IC.

	☐ enclosed	☐ not requested	☒ nothing listed
Archaeological Determinations of Eligibility:	☐ enclosed	☐ not requested	☒ nothing listed
CA Inventory of Historic Resources (1976):	☐ enclosed	☒ not requested	☐ nothing listed
Caltrans Bridge Survey:	☐ enclosed	☒ not requested	☐ nothing listed
Ethnographic Information:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Literature:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Maps:	☐ enclosed	☒ not requested	☐ nothing listed
Local Inventories:	☐ enclosed	☒ not requested	☐ nothing listed
GLO and/or Rancho Plat Maps:	☐ enclosed	☒ not requested	☐ nothing listed

Shipwreck Inventory: ☒ not available at CCIC; please go to
http://shipwrecks.slc.ca.gov/ShipwrecksDatabase/Shipwrecks_Database.asp

Soil Survey Maps: ☒ not available at CCIC; please go to
http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System (CHRIS).

Note: Billing will be transmitted separately via email by our Financial Services office *($474.60), payable within 60 days of receipt of the invoice.

If you wish to include payment by Credit Card, you must wait to receive the official invoice from Financial Services so that you can reference the CMP # (Invoice Number), and then contact the link below:

https://commerce.cashnet.com/ANTHROPOLOGY

Sincerely,

E. A. Greathouse

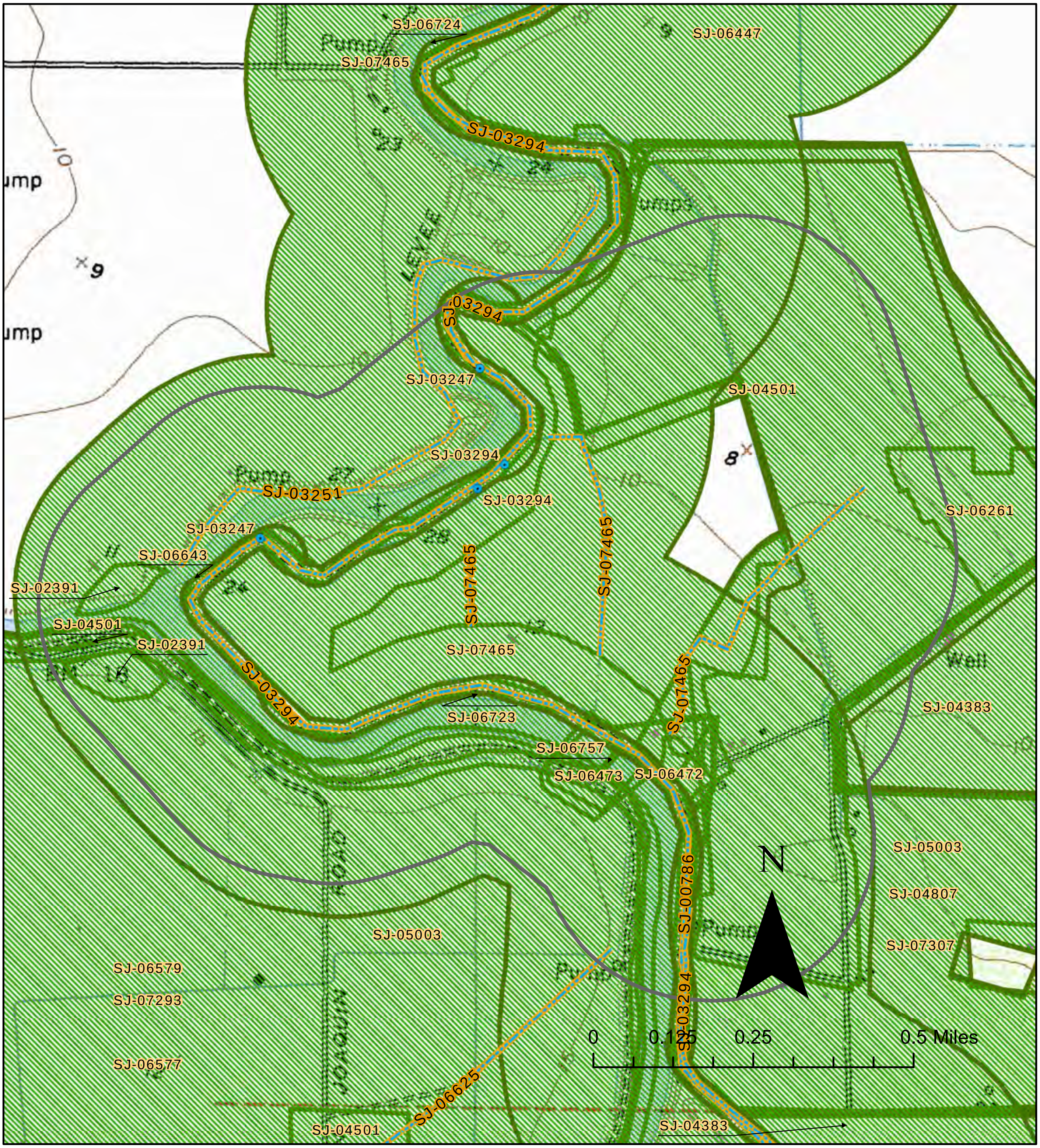
E. A. Greathouse, Coordinator
Central California Information Center
California Historical Resources Information System

* Invoice Request sent to: ARBilling@csustan.edu, CSU Stanislaus Financial Services

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-39-004339	CA-SJO-000300H	Resource Name - Moss-1	Site	Historic	AH04	2001 (Richard Deis, EDAW, Inc.)	SJ-04807, SJ-07307
P-39-004340	CA-SJO-000281H	Resource Name - Moss-2	Site	Historic	AH04; AH10; AH15; HP02	2001 (Richard Deis, EDAW, Inc.)	SJ-04807, SJ-05003, SJ-06447, SJ-07307
P-39-004341		Resource Name - Moss Isolate 1	Other	Prehistoric	AP16	2001 (Richard Deis, EDAW, Inc.)	SJ-04807, SJ-07307
P-39-004342		Resource Name - Moss Isolate 2	Other	Historic	AH16	2001 (Richard Deis, EDAW, Inc.)	SJ-04807, SJ-06447, SJ-07307
P-39-004343		Resource Name - Moss Isolate 3	Other	Historic	AH16	2001 (Richard Deis, EDAW, Inc.)	SJ-04807, SJ-07307
P-39-004345		Resource Name - Moss Isolate 5	Other	Prehistoric	AP16	2002 (Richard Deis, EDAW, Inc.)	SJ-04807, SJ-06447, SJ-07307, SJ-07465
P-39-004346		Resource Name - Moss Isolate 6	Other	Prehistoric	AH16	2002 (Richard Deis, EDAW, Inc.)	SJ-04807, SJ-06447, SJ-07307, SJ-07465
P-39-004347		Resource Name - Moss Isolate 7	Other	Prehistoric	AP16	2002 (Richard Deis, EDAW, Inc.)	SJ-04807, SJ-06447, SJ-07307
P-39-004602		Resource Name - Silveria Complex	Building	Historic	HP02; HP04; HP33	2006 (Tom Origer & Associates, Tom Origer & Associates)	SJ-06472, SJ-06473, SJ-06757, SJ-07465
P-39-004857		Resource Name - Old River Levees	Structure	Historic	HP11	2011 (Rebecca H. Gilbert, CA Department of Water)	SJ-07442
P-39-005086		Resource Name - RD 17 West Levee; Resource Name - Walthal Slough Dry Land Levee	Structure	Historic	HP11	2008 (Brian Ludwig, AECOM); 2012 (Cindy Arrington, Parus Consulting, Inc)	SJ-07465, SJ-07581

CCaIC 12266L Mossdale West
Reports 1/4-mile radius 1:14,000-scale
Lathrop USGS 7.5' Quadrangle



Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SJ-00786	NADB-R - 1361578	1988	Napton, L. K., Ph. D.	Cultural Resources Investigation of the Proposed Weston Ranch Levee Improvement Project, San Joaquin County, California.	CSU, Stanislaus Institute for Archaeological Research; for Valley Planning Consultants, Inc., Merced, Ca	39-000014, 39-000141, 39-000225, 39-000227, 39-000282
SJ-02391	NADB-R - 1361277	1994	West, J. G.	A Class III Archaeological Survey of the South Delta Water Management Program Area, San Joaquin and Contra Costa Counties, California.	J. G. West	
SJ-03247	NADB-R - 1363576; Other - 97-016	1997	Peak and Associates, Inc.	Cultural Resources Assessment within Reclamation District 17 San Joaquin County, California (SJ4) for: Cultural Resource Inventory and Evaluation for the U.S. Army Corps of Engineers, Sacramento District Pl-84-99 Levee Rehabilitation on the Feather, Bear, Sacramento and San Joaquin River Systems. DACW05-97-P-0385	Peak and Associates, Inc. for USACOE	39-000225
SJ-03251	NADB-R - 1363580	1997	Peak and Associates	Cult. Resources Assessment Within Reclamation Dist. 544/524, San Joaquin Co., for: Cult. Resource Inventory and Evaluation for the US Army COE Sacramento Dist. PL 84-99 Levee Rehab.--Feather, Bear, Sacramento and San Joaquin River Systems	Peak and Associates	
SJ-03294	NADB-R - 1363332	1998	Deitz, F.	Cultural Resources Assessment within Reclamation District 17 San Joaquin County, California (SJ4) for: Cultural Resource Inventory and Evaluation for the U.S. Army Corps of Engineers, Sacramento Distritct Pl-84-99 Levee Rehabilitation on the Feather, Bear, Sacramento and San Joaquin River Systems	U.S. Army Corps of Engineers	
SJ-04383	NADB-R - 1364295	2001	Jensen, Peter M.	Archaeological Inventory Survey, Proposed Lathrop Station Residential and Commercial Development Project, c.146.5 Acres in Two Parcels, Lathrop, San Joaquin County, California.	Jensen and Associates	
SJ-04501	NADB-R - 1364416	1994	Wohlgemuth, E. and C. Trent Mears	A Cultural Resource Survey of the Stewart Tract and Mossdale Areas of the West Lathrop Specific Plan, San Joaquin County, California.	Far Western Anthropological Research Group, Inc., for Grunwald and Associates	39-000006, 39-000007, 39-000008, 39-000009, 39-000010, 39-000011, 39-000012, 39-000013, 39-000014

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SJ-04807	NADB-R - 1364718	2002	Gross, C.	Cultural Resources Survey for the Mossdale Landing Urban Design Concept, City of Lathrop, San Joaquin County, California. SCH #2001052059.	EDAW, Inc.	39-004339, 39-004340, 39-004341, 39-004342, 39-004343, 39-004344, 39-004345, 39-004346, 39-004347
SJ-05003	NADB-R - 1364888	2003	Gross, C. H.	Cultural Resources Assessment for the Lathrop Water Recycling Plant No. 1, Phase I Expansion Project.	EDAW, Inc.	39-000007, 39-000141, 39-004333, 39-004340
SJ-06261	NADB-R - 1366428	2006	Jensen, S.	Archaeological Inventory Survey, Mossdale Village 1A Project, c. 13-acres, Lathrop, San Joaquin County, California.	Genesis Society	
SJ-06447	NADB-R - 1366667	2007	URS Corporation	Cultural Resources Report for the Geotechnical Evaluation Project, December 2006.	URS Corp.; for Dept. of Water Resources	39-000002, 39-000012, 39-000014, 39-000098, 39-000218, 39-000282, 39-000342, 39-004234, 39-004235, 39-004340, 39-004342, 39-004344, 39-004345, 39-004346, 39-004347, 39-004357, 39-004510
SJ-06472	NADB-R - 1366697	2007	Beard, V.	Historic Resources Evaluation Report for the Bradshaw's Crossing Bridge Project near Lathrop, San Joaquin County, California	Tom Origer & Associates	39-004602
SJ-06473	NADB-R - 1366698	2007	Beard, V. and S. A. Ledebuhr	Archaeological Survey Report, Bradshaw's Crossing Project, Lathrop, San Joaquin County, California	Tom Origer & Associates	39-004602
SJ-06577	NADB-R - 1366823	2002	Gross, C.	Cultural Resources Assessment for the River Islands Development Project City of Lathrop, San Joaquin County, CA	EDAW Inc.	39-000548, 39-004333, 39-004334, 39-004335, 39-004336
SJ-06579	NADB-R - 1366786	2004	Dolan, C	Historical Architectural Assessment for the River Islands Development Project, City of Lathrop, San Joaquin County, CA	EDAW Inc.	39-000548, 39-004334, 39-004648, 39-004649, 39-004650, 39-004651, 39-004652, 39-004653, 39-004654, 39-004655, 39-004656, 39-004657, 39-004658, 39-004659, 39-004660, 39-004661
SJ-06625	NADB-R - 1367290	1998	ASI Archaeology and Cultural Resource Management	Cultural Resources Survey, South County Surface Water Project, San Joaquin County, California, South San Joaquin Irrigation District	ASI Archaeology and Cultural Resource Management (prepared for Environmental Science Associates, Inc.)	39-000002, 39-000098, 39-000129, 39-000317, 39-000531, 39-000548, 50-000001
SJ-06643	NADB-R - 1366890	2008	URS Corporation	Technical Report, Final: Cultural Resources Report for Geotechnical Evaluation of the Reclamation District 17 Supplemental Explorations.	URS Corp.; for Dept. of Water Resources	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SJ-06723	NADB-R - 1367019	2008	URS Corporation	Technical Report, Final: Cultural Resources Survey Report for the Urban Levee Project.	URS Corporation; for Department of Water Resources	
SJ-06724	NADB-R - 1367026	2008	URS Corporation	Technical Report, Final: Cultural Resources Baseline Literature Review for the Urban Levee Project.	URS Corporation; for Department of Water Resources	39-002513
SJ-06757	NADB-R - 1366998	2006	Stratton, S. K.	Letter: Bradshaw's Crossing Bridge, City of Lathrop, San Joaquin County, California	Office of Historic Preservation Letter to Monk Associates	39-004602
SJ-07293	NADB-R - 1367635	2002	EDAW, Inc.	Draft Subsequent Environmental Impact Report for the River Islands at Lathrop Project Volume Ib: Draft SEIR (Section 4.8-Chapter 10), State Clearinghouse No. 1993112027.	EDAW, Inc.	39-000002, 39-000098, 39-000548, 39-004333, 39-004334, 39-004335, 39-004336, 39-004648, 39-004650, 39-004651, 39-004652, 39-004653, 39-004654, 39-004655, 39-004657, 39-004659, 39-004660, 39-004661
SJ-07307	NADB-R - 1367625	2002	EDAW, Inc.	Draft Environmental Impact Report for the Mossdale Landing Urban Design Concept SCH#2001052059 Volumne I: DEIR	EDAW, Inc.	39-004339, 39-004340, 39-004341, 39-004342, 39-004343, 39-004344, 39-004345, 39-004346, 39-004347
SJ-07465	NADB-R - 1367812	2011	Shephard, A.	Cultural Resources Inventory and Evaluation Report for the Phase 3 Reclamation District 17 100-Year Levee Seepage Area Project	AECOM; for Reclamation District 17	39-000002, 39-000014, 39-004345, 39-004346, 39-004602, 39-005086

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA, 95814-2922

Environmental Resources Branch

Mr. Milford Wayne Donaldson, FAIA
State Historic Preservation Officer
Office of Historic Preservation
Department of Parks and Recreation
1725 23rd Street, Suite 100
Sacramento, CA 95816

Dear Mr. Donaldson:

This letter initiates consultation with your office for the proposed Reclamation District 17 Phase 3 100-Year Levee Seepage Project as required under Section 106 of the National Historic Preservation Act. Reclamation District 17 (RD 17) is considering a series of levee improvements as part of the Phase 3 100-Year Levee Seepage Project, as described in the enclosed report entitled, Cultural Resources Inventory and Evaluation Report, Phase 3 RD 17 100-Year Levee Seepage Area Project (prepared by AECOM, February 2011). Proposed levee improvements would occur along various sections of the RD 17 levee system starting near the southern boundary of the city of Stockton, through the city of Lathrop, and to the southern boundary of the city of Manteca, all within greater San Joaquin County, California. RD 17 has initiated this effort in cooperation with the California Department of Water Resources, the California Central Valley Flood Protection Board, and the U.S. Army Corps Engineers (USACE) with the aim of reducing flood risk during the projected 100-year flood event.

The RD 17 Phase 3 Project requires authorization from USACE pursuant to Section 408 of the Rivers and Harbors Act of 1899 (33 U.S. Code [USC] 408) for alteration of federal project levees; and Section 404 of the Clean Water Act (33 USC 1344) for the placement of fill in jurisdictional waters of the United States. These actions are undertakings that require compliance with Section 106 of the National Historic Preservation Act (16 USC 470f). The enclosed report describes the results of a cultural resource inventory report that identifies cultural resources within the area of potential effect (APE), evaluates those resources for listing in the National Register of Historic Places (NRHP), and makes a finding of effect, as required in the Section 106 regulations (36 CFR Part 800).

The proposed APE is depicted on page 5 (Exhibit 2) of the enclosed inventory report. The APE depicts the maximum footprint where ground-disturbing construction would occur, and thus the area in which the project could directly or indirectly affect historic properties, in accordance with 36 CFR Part 800.4 (a)(1). Three resources were identified within the APE: site CA-SJO-250/H (California Historical Landmark No. 780 consists of a section of the old Southern Pacific rail line and vertical-lift drawbridge crossing on the San Joaquin River); the Silviera Ranch Complex (P-39-004602) and a portion of the historic Reclamation District West Levee itself that forms the western boundary of the basin protected by RD 17. The Silviera Ranch Complex site (P-39-004602) was previously determined ineligible for listing in the NRHP by your office in 2007 in reference to a report entitled, *Historic Resources Evaluation for the Bradshaw's Crossing Bridge Project Near Lathrop San Joaquin County, Texas*, prepared by V. Beard (Tom Origer & Associates, 2007). Sites CA-SJO-250/H and the RD Levee are considered eligible for listing on the National Register of Historic Places under 36 CFR 60.4, Criterion A (sites that are associated with events that have made a significant contribution to the broad patterns of our history – respectively, an historic railway transportation route and an historic levee system within the lower San Joaquin River Delta region of California). However, no adverse impacts are proposed for both sites CA-SJO-250/H and the historic RD 17 West Levee located within the proposed APE by the Reclamation District 17 Phase 3 100-Year Levee Seepage project undertaking as described above. More specifically, no levee reconstruction work or associated activities will occur at NRHP eligible site CA-SJO-250/H. The proposed levee reconstruction work proposed for the historic RD 17 West Levee will be routine maintenance and repair activities that are not considered deleterious or significant enough to jeopardize the NRHP eligibility status of the historic RD 17 West Levee system as a whole.

Therefore, we request your concurrence with the definition of the Area of Potential Effect (APE) as depicted on page 5 (Exhibit 2) of the enclosed inventory report (36 CFR 800.4(a)(1). We request your concurrence with our determination of a no adverse effect finding for NRHP eligible sites, CA-SJO-250/H (California Historical Landmark No. 780), and the historic RD 17 West Levee in accordance with 36 CFR 800.5 (b). We also request your concurrence to our determination of a no historic properties affected finding for the Silviera Ranch Complex Site (P-39-004602) under 36 CFR 800.4 (d)(1). If you have any questions or need any additional information, please contact Mr. Bryan Guevin at 916-557-7378, or by email at bryan.guevin@usace.army.mil.

Sincerely,

Alicia E. Kirchner
Chief, Planning Division

Enclosure

Copies Furnished:

Mr. Dante Nomelini, Reclamation District 17, P.O. Box 1461, Stockton, California 95201
Mr. Michael Avina, AECOM, 2020 L Street, Sacramento, California 95811 (without Enclosure)

hle

STATE OF CALIFORNIA - THE NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax. (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

April 6, 2011

In Reply Refer To: COE110404A

Alicia E. Kirchner
Chief, Planning Division
Department of the Army
U.S. Army Engineer District
Sacramento Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Re: Reclamation District 17 Phase 3 100-Year Levee Seepage Project, San Joaquin County, California.

Dear Ms. Kirchner:

Thank you for submitting to my office your letter and supporting documentation regarding the project noted above. The U.S. Army Engineer District, Sacramento Corps of Engineers is seeking my comments on the effects that the Reclamation District 17 Phase 3 100-Year Levee Seepage Project will have on historic properties, pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act (NHPA). Reclamation District 17 (RD 17) is requesting authorization from the COE to construct this project pursuant to Section 408 (33 U.S. Code [USC] 408) regarding the alteration of federal project levees, and Section 404 of the Clean Water Act (33 USC 1344) regarding the placement of fill material in waters of the United States. The COE has identified this action as an undertaking subject to review under Section 106 of the NHPA.

The undertaking will consist of the construction of levee improvements along sections of levees owned by RD 17 extending from the City of Stockton, through the City of Lathrop, to the southern boundary of the City of Manteca. The majority of these levee repair sites are along the east bank of the San Joaquin River. The Area of Potential Effects (APE) for this undertaking includes all proposed construction sites and all other ground-disturbing locations (e.g.: staging areas) designated for Phase 3 of the project as documented on exhibit 2 of the report cited below. In addition to your letter of March 30, 2011, you have submitted the following document in support of your efforts to identify historic properties in the APE:

• *Cultural Resources Inventory and Evaluation Report Phase 3 RD 17 100-Year Levee Seepage Area Project* (AECOM: February 2011).

Identification efforts by the COE have determined that there are three cultural resources (and several isolates that are not historic properties under National Register of Historic Places guidelines) located within the project APE. These are the Silviera Ranch

Complex (P-39-004602), the Reclamation 17 West Levee that forms the western boundary of RD 17, and a segment of the South Pacific Railroad that includes a vertical lift railroad drawbridge (Bradshaw's Crossing Bridge) across the San Joaquin River. The Silviera Ranch has previously been determined ineligible for the National Register of Historic Places by Section 106 consensus (SHPO file USCG060605A, SHPO letter of January 26, 2007). The Bradshaw's Crossing Bridge and the segment of Southern Pacific Railroad is a portion of CA-SJO-250H, although the original bridge was replaced in 1895 and again in 1942 by the current structure. This is a component of State Historic Landmark #780, First Transcontinental Railroad and is listed on the California Register of Historic Resources.

The COE, in consultation with the SHPO, has proposed to treat both the Southern Pacific Railroad (including the Bradshaw's Crossing Bridge) and the RD 17 West Levee as eligible for the NRHP under criterion A for the purposes of this undertaking. Under this strategy the COE has determined that the undertaking as proposed will have no adverse effect, either direct or visual, to CA-SJO-250H and that the proposed levee repairs and improvement are standard types of repair and maintenance/upgrade activities that will not adversely affect any of the qualities that would impart NRHP eligibility to the RD 17 West Levee. The COE thus proposes that a finding of No Adverse Effect is appropriate in accordance with 36 CFR Part 800.5(b).

After reviewing your letter and supporting documentation, and considering the additional information from a phone contact and emails (April 6, 2011) between Bryan Guevin of your staff and William Soule of my staff, I have no objection to your finding of No Adverse Effect for this undertaking. Be advised that under certain circumstances, such as unanticipated discovery or a change in project description, the COE may have additional future responsibilities for this undertaking under 36 CFR Part 800. Thank you for seeking my comments and for considering historic properties in planning your project. If you require further information, please contact William Soule, Associate State Archeologist at phone 916-445-7022 or email wsoule@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

APPENDIX 3

Confidential: Not for Distribution

APPENDIX C.2

Tribal Consultation

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov

October 12, 2022

Robert Gerry
Peak & Associates Inc.

Via Email to: peakinc@surewest.net

Re: Mossdale West Project, San Joaquin County

Dear Mr. Gerry:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information submitted for the above referenced project. The results were positive. Please contact the North Valley Yokuts Tribe on the attached list for information. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. A SLF search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with a project's geographic area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites, such as the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center for the presence of recorded archaeological sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Pricilla.Torres-Fuentes@nahc.ca.gov.

Sincerely,

Pricilla Torres-Fuentes

Pricilla Torres-Fuentes
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Joaquin County
10/12/2022

Buena Vista Rancheria of Me-Wuk Indians
Rhonda Morningstar Pope, Chairperson
1418 20th Street, Suite 200 — Me-Wuk
Sacramento, CA, 95811
Phone: (916) 491 - 0011
Fax: (916) 491-0012
rhonda@buenavistatribe.com

California Valley Miwok Tribe
AKA Sheep Rancheria of Me-Wuk Indians of CA,
P.O. Box 395 — Miwok
West Point, CA, 95255
Phone: (209) 293 - 4179
l.ewilson@yahoo.com

California Valley Miwok Tribe
14807 Avenida Central — Miwok
La Grange, CA, 95329
Phone: (209) 931 - 4567
Fax: (209) 931-4333

Ione Band of Miwok Indians
Sara Dutschke, Chairperson
9252 Bush Street — Miwok
Plymouth, CA, 95669
Phone: (209) 245 - 5800
consultation@ionemiwok.net

Muwekma Ohlone Indian Tribe of the SF Bay Area
Monica Arellano, Vice Chairwoman
20885 Redwood Road, Suite 232 — Costanoan
Castro Valley, CA, 94546
Phone: (408) 205 - 9714
monicavarellano@gmail.com

North Valley Yokuts Tribe
Timothy Perez,
P.O. Box 717 — Costanoan, Northern Valley Yokut
Linden, CA, 95236
Phone: (209) 662 - 2788
huskanam@gmail.com

North Valley Yokuts Tribe
Katherine Perez, Chairperson
P.O. Box 717 — Costanoan, Northern Valley Yokut
Linden, CA, 95236
Phone: (209) 887 - 3415
canutes@verizon.net

Tule River Indian Tribe
Kerri Vera, Environmental Department
P. O. Box 589 — Yokut
Porterville, CA, 93258
Phone: (559) 783 - 8892
Fax: (559) 783-8932
kerri.vera@tulerivertribe-nsn.gov

Tule River Indian Tribe
Neil Peyron, Chairperson
P.O. Box 589 — Yokut
Porterville, CA, 93258
Phone: (559) 781 - 4271
Fax: (559) 781-4610
neil.peyron@tulerivertribe-nsn.gov

Tule River Indian Tribe
Joey Garfield, Tribal Archaeologist
P. O. Box 589 — Yokut
Porterville, CA, 93258
Phone: (559) 783 - 8892
Fax: (559) 783-8932
joey.garfield@tulerivertribe-nsn.gov

Wilton Rancheria
Dahlton Brown, Director of Administration
9728 Kent Street — Miwok
Elk Grove, CA, 95624
Phone: (916) 683 - 6000
dbrown@wiltonrancheria-nsn.gov

Wilton Rancheria
Jesus Tarango, Chairperson
9728 Kent Street — Miwok
Elk Grove, CA, 95624
Phone: (916) 683 - 6000
Fax: (916) 683-6015
jtarango@wiltonrancheria-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Mossdale West Project, San Joaquin County.

Native American Heritage Commission
Native American Contact List
San Joaquin County
10/12/2022

Wilton Rancheria Steven Hutchason, THPO 9728 Kent Street Elk Grove, CA, 95624 Phone: (916) 683 - 6000 Fax: (916) 863-6015 shutchason@wiltonrancheria-nsn.gov	Miwok
Wuksache Indian Tribe/Eshom Valley Band Kenneth Woodrow, Chairperson 1179 Rock Haven Ct. Salinas, CA, 93906 Phone: (831) 443 - 9702 kwood8934@aol.com	Foothill Yokut Mono
The Confederated Villages of Lisjan Corrina Gould, Chairperson 10926 Edes Avenue Oakland, CA, 94603 Phone: (510) 575 - 8408 cvltribe@gmail.com	Bay Miwok Ohlone Delta Yokut

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Mossdale West Project, San Joaquin County.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

Buena Vista Rancheria of Me-Wuk Indians
Attn: Mr. Rhonda Morningstar Pope, Chairperson
1418 20th Street, Suite 200
Sacramento, CA 95811

RE: AB 52 & SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Ms. Pope:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Assembly Bill 52 and Section 21080.3.1(d) of the California Public Resources Code

In accordance with Assembly Bill 52 (AB52) and Section 21080.3.1(d) of the California Public Resources Code (PRC), we are responding to your request to be notified of projects in our jurisdiction that will be reviewed under CEQA. We are hereby notifying you of an opportunity to consult with us regarding the potential for this project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purpose of tribal consultation under AB52 is to determine, as part of the CEQA process, whether or not Tribal Cultural Resources are present within the project area and if so, determine whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the appropriate way to avoid or mitigate those impacts.

In accordance with Public Resources Code §21080.3.1 (b), you have thirty (30) days from the receipt of this letter to request consultation, in writing, with the City of Lathrop.

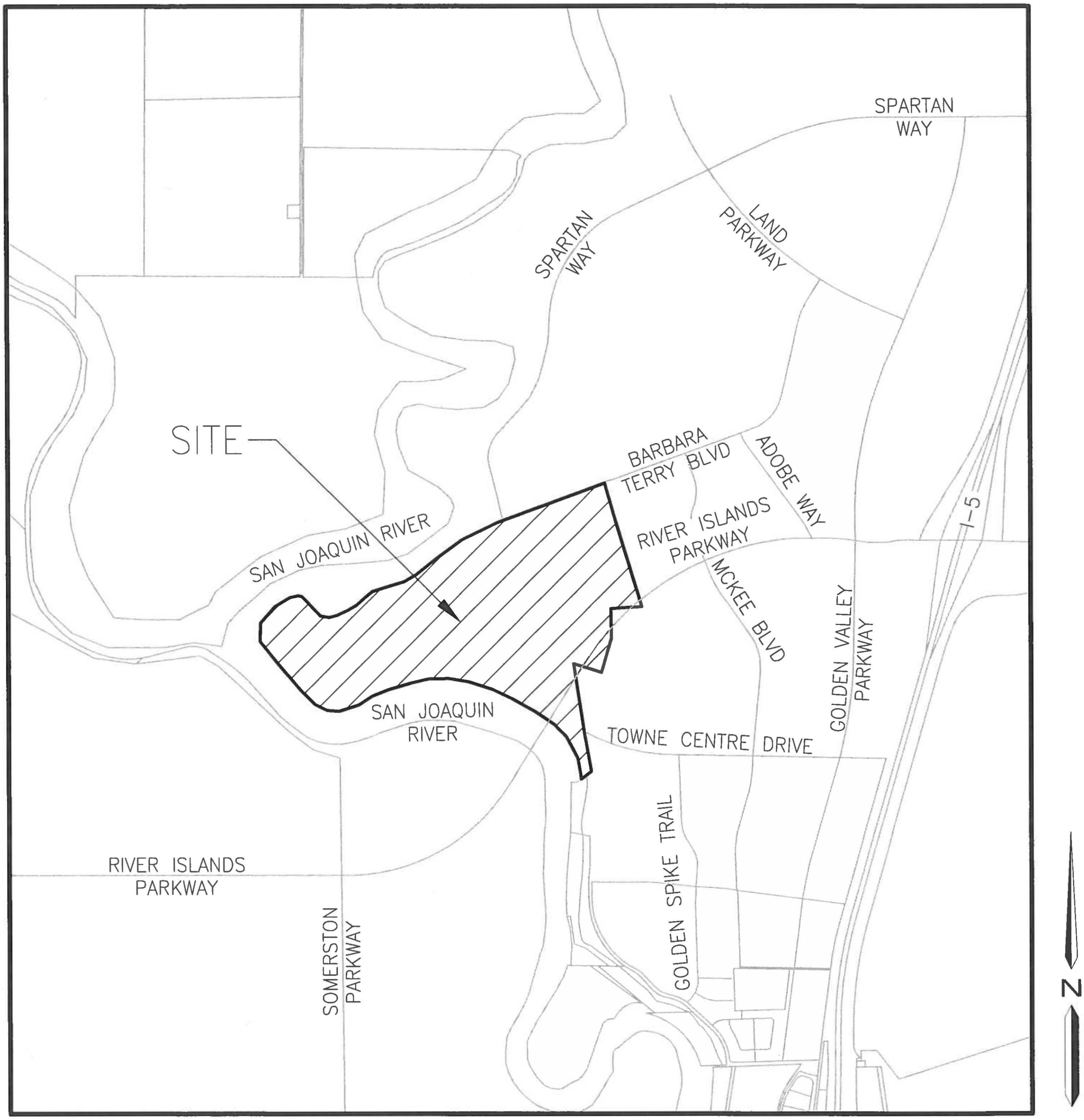
Government Code Sections 65352 and 65352.3 (SB 18)
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

California Valley Miwok Tribe
AKA Sheep Rancheria of Me-Wuk Indians of CA
P.O. Box 395
West Point, CA 95255

RE: AB 52 & SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

To Whom It May Concern:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Assembly Bill 52 and Section 21080.3.1(d) of the California Public Resources Code
In accordance with Assembly Bill 52 (AB52) and Section 21080.3.1(d) of the California Public Resources Code (PRC), we are responding to your request to be notified of projects in our jurisdiction that will be reviewed under CEQA. We are hereby notifying you of an opportunity to consult with us regarding the potential for this project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purpose of tribal consultation under AB52 is to determine, as part of the CEQA process, whether or not Tribal Cultural Resources are present within the project area and if so, determine whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the appropriate way to avoid or mitigate those impacts.

In accordance with Public Resources Code §21080.3.1 (b), you have thirty (30) days from the receipt of this letter to request consultation, in writing, with the City of Lathrop.

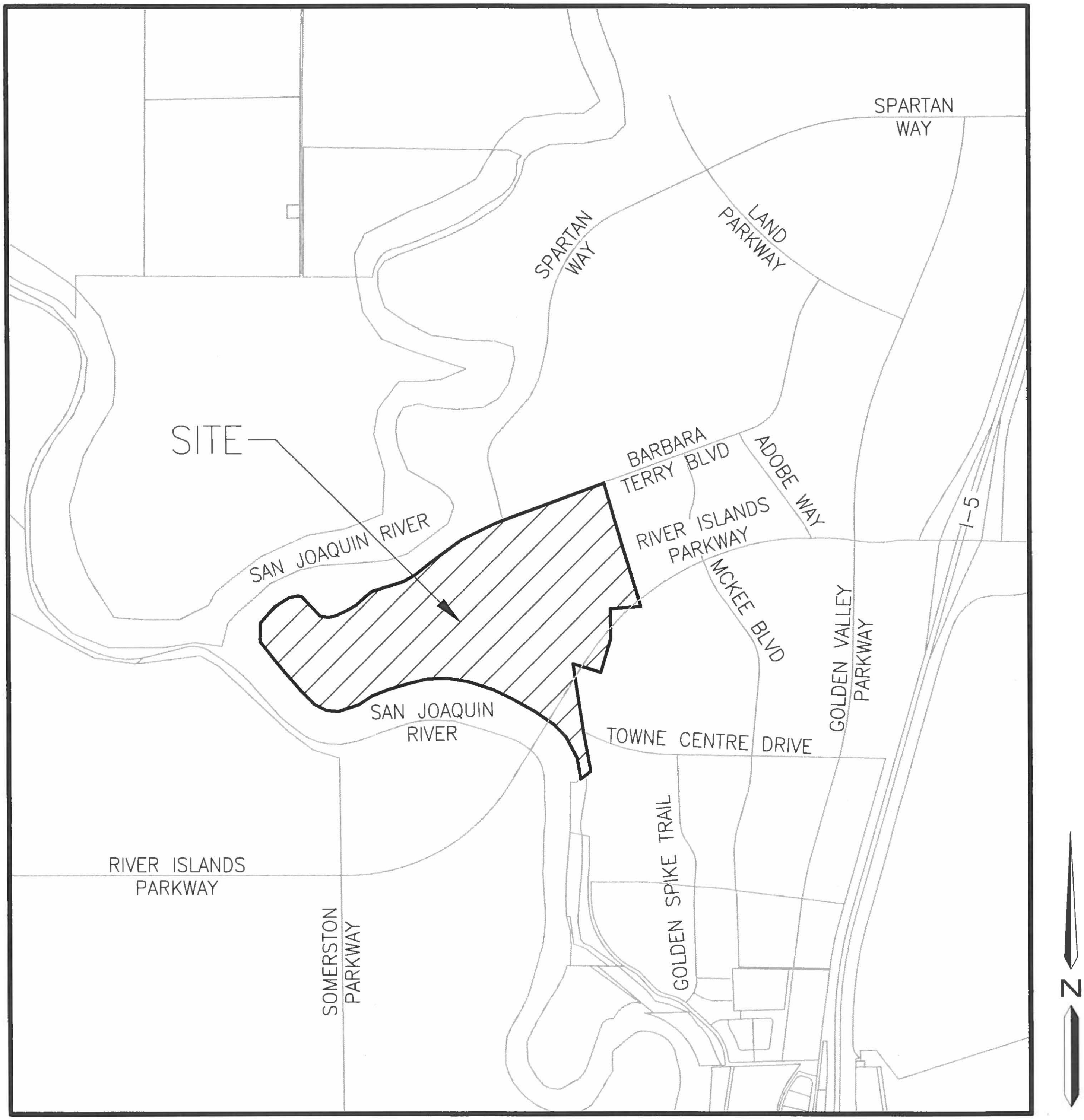
Government Code Sections 65352 and 65352.3 (SB 18)
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

North Valley Yokuts Tribe
Attn: Mr. Timothy Perez
P.O. Box 717
Linden, CA 95236

RE: AB 52 & SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Mr. Perez:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Assembly Bill 52 and Section 21080.3.1(d) of the California Public Resources Code
In accordance with Assembly Bill 52 (AB52) and Section 21080.3.1(d) of the California Public Resources Code (PRC), we are responding to your request to be notified of projects in our jurisdiction that will be reviewed under CEQA. We are hereby notifying you of an opportunity to consult with us regarding the potential for this project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purpose of tribal consultation under AB52 is to determine, as part of the CEQA process, whether or not Tribal Cultural Resources are present within the project area and if so, determine whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the appropriate way to avoid or mitigate those impacts.

In accordance with Public Resources Code §21080.3.1 (b), you have thirty (30) days from the receipt of this letter to request consultation, in writing, with the City of Lathrop.

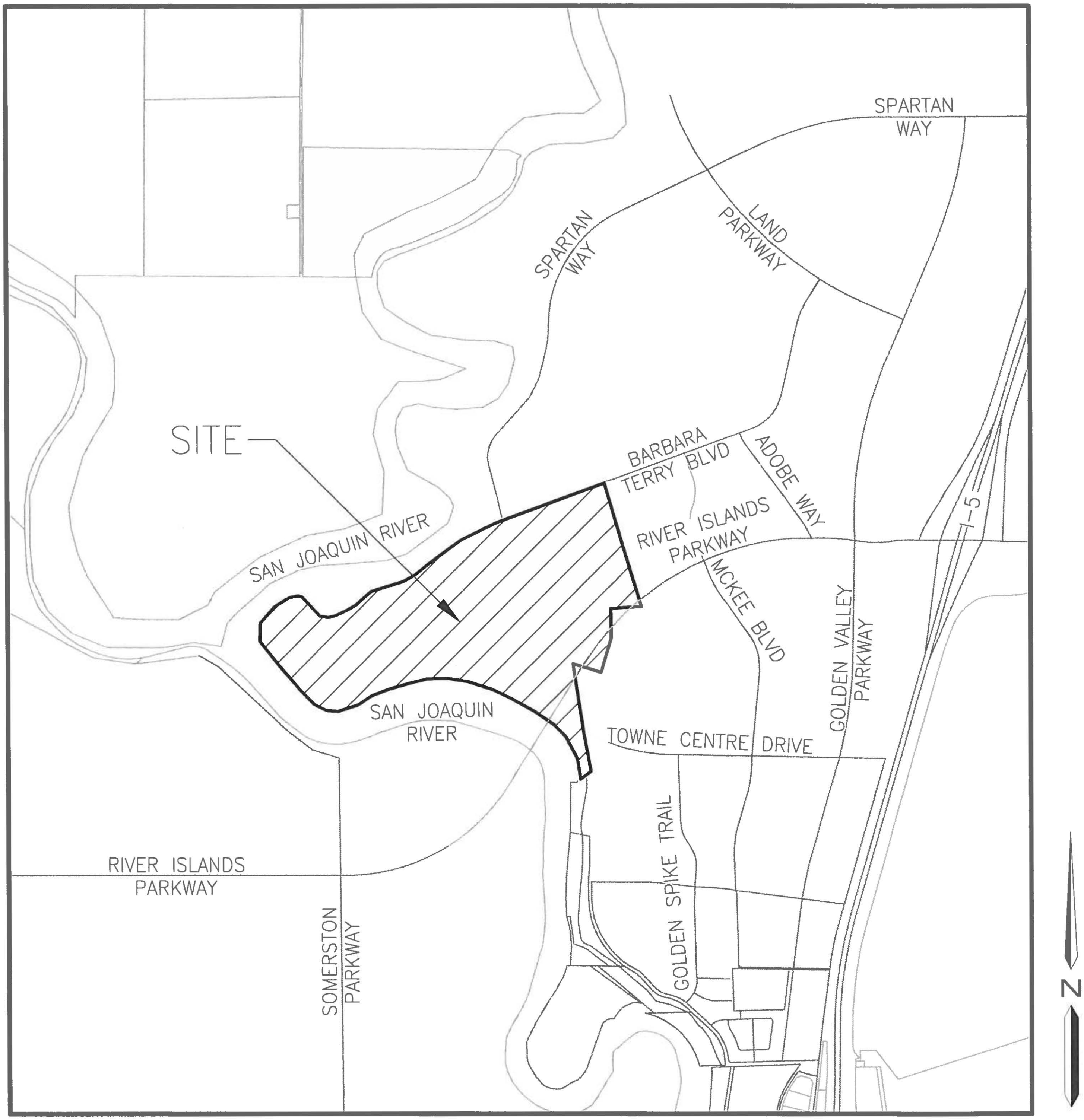
Government Code Sections 65352 and 65352.3 (SB 18)
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

North Valley Yokuts Tribe
Attn: Mr. Katherine Perez, Chairperson
P.O. Box 717
Linden, CA 95236

RE: AB 52 & SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Ms. Perez:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Assembly Bill 52 and Section 21080.3.1(d) of the California Public Resources Code
In accordance with Assembly Bill 52 (AB52) and Section 21080.3.1(d) of the California Public Resources Code (PRC), we are responding to your request to be notified of projects in our jurisdiction that will be reviewed under CEQA. We are hereby notifying you of an opportunity to consult with us regarding the potential for this project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purpose of tribal consultation under AB52 is to determine, as part of the CEQA process, whether or not Tribal Cultural Resources are present within the project area and if so, determine whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the appropriate way to avoid or mitigate those impacts.

In accordance with Public Resources Code §21080.3.1 (b), you have thirty (30) days from the receipt of this letter to request consultation, in writing, with the City of Lathrop.

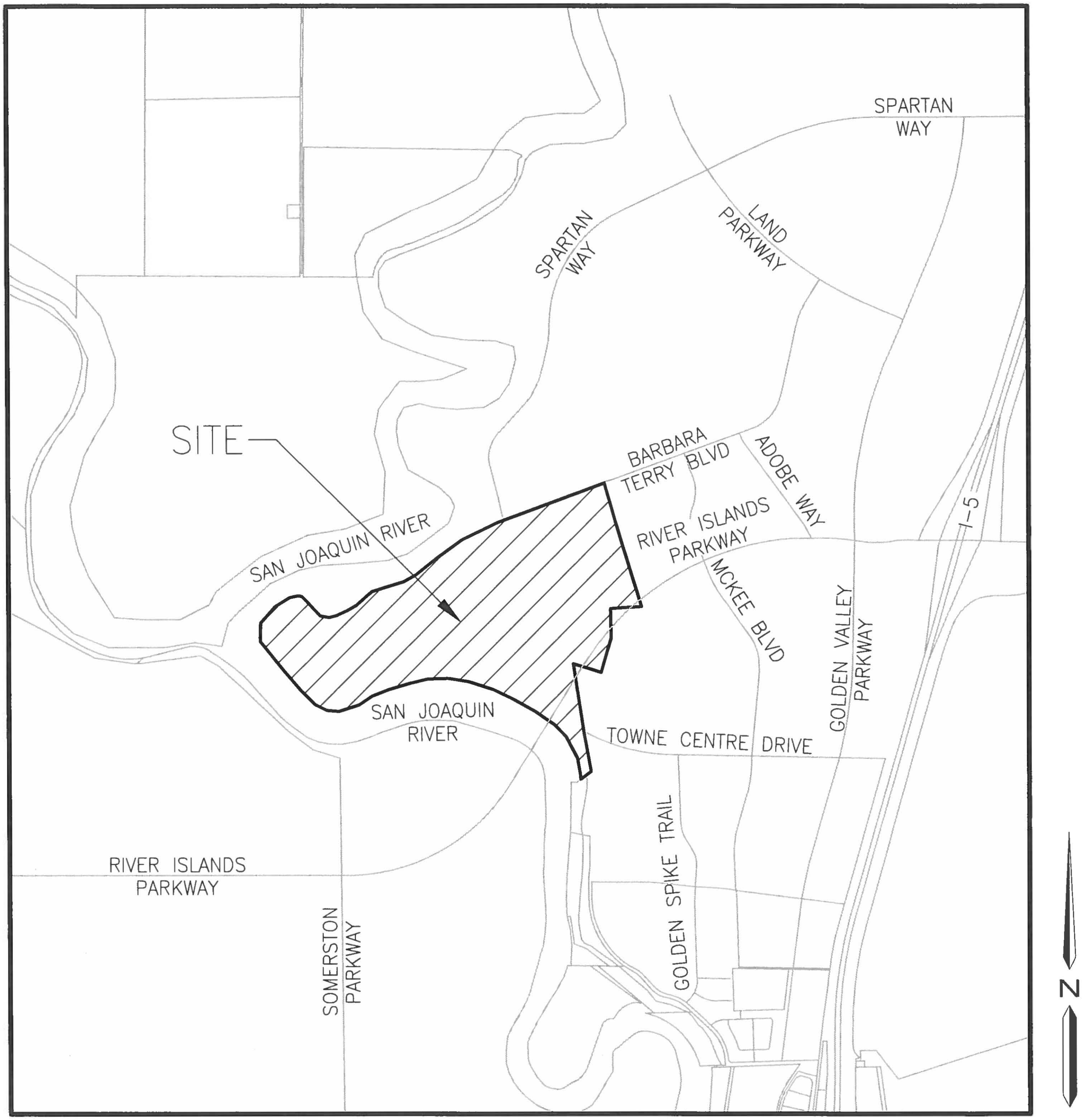
Government Code Sections 65352 and 65352.3 (SB 18)
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

The Confederated Villages of Lisjan
Attn: Corrina Gould, Chairperson
10926 Edes Avenue
Oakland, CA 94603

RE: AB 52 & SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Ms. Gould:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Assembly Bill 52 and Section 21080.3.1(d) of the California Public Resources Code
In accordance with Assembly Bill 52 (AB52) and Section 21080.3.1(d) of the California Public Resources Code (PRC), we are responding to your request to be notified of projects in our jurisdiction that will be reviewed under CEQA. We are hereby notifying you of an opportunity to consult with us regarding the potential for this project to impact Tribal Cultural Resources, as defined in Section 21074 of the PRC. The purpose of tribal consultation under AB52 is to determine, as part of the CEQA process, whether or not Tribal Cultural Resources are present within the project area and if so, determine whether or not those resources will be significantly impacted by the project. If Tribal Cultural Resources may be significantly impacted, then consultation will also help to determine the appropriate way to avoid or mitigate those impacts.

In accordance with Public Resources Code §21080.3.1 (b), you have thirty (30) days from the receipt of this letter to request consultation, in writing, with the City of Lathrop.

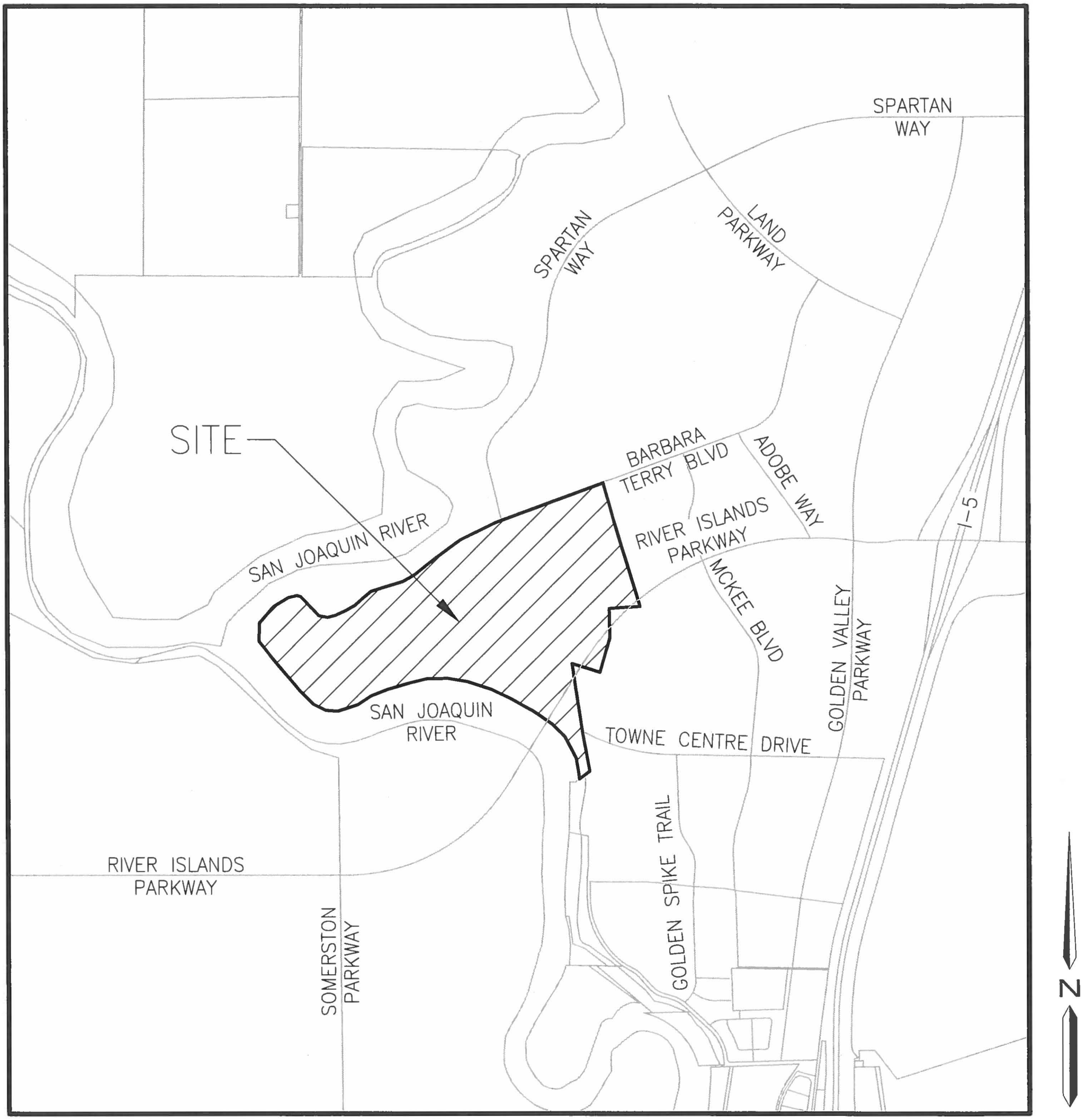
Government Code Sections 65352 and 65352.3 (SB 18)
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

Ione Band of Miwok Indians
Attn: Ms. Sara Dutschke, Chairperson
9252 Bush Street
Plymouth, CA 95669

RE: SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

To Whom It May Concern:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Government Code Sections 65352 and 65352.3 (SB 18)

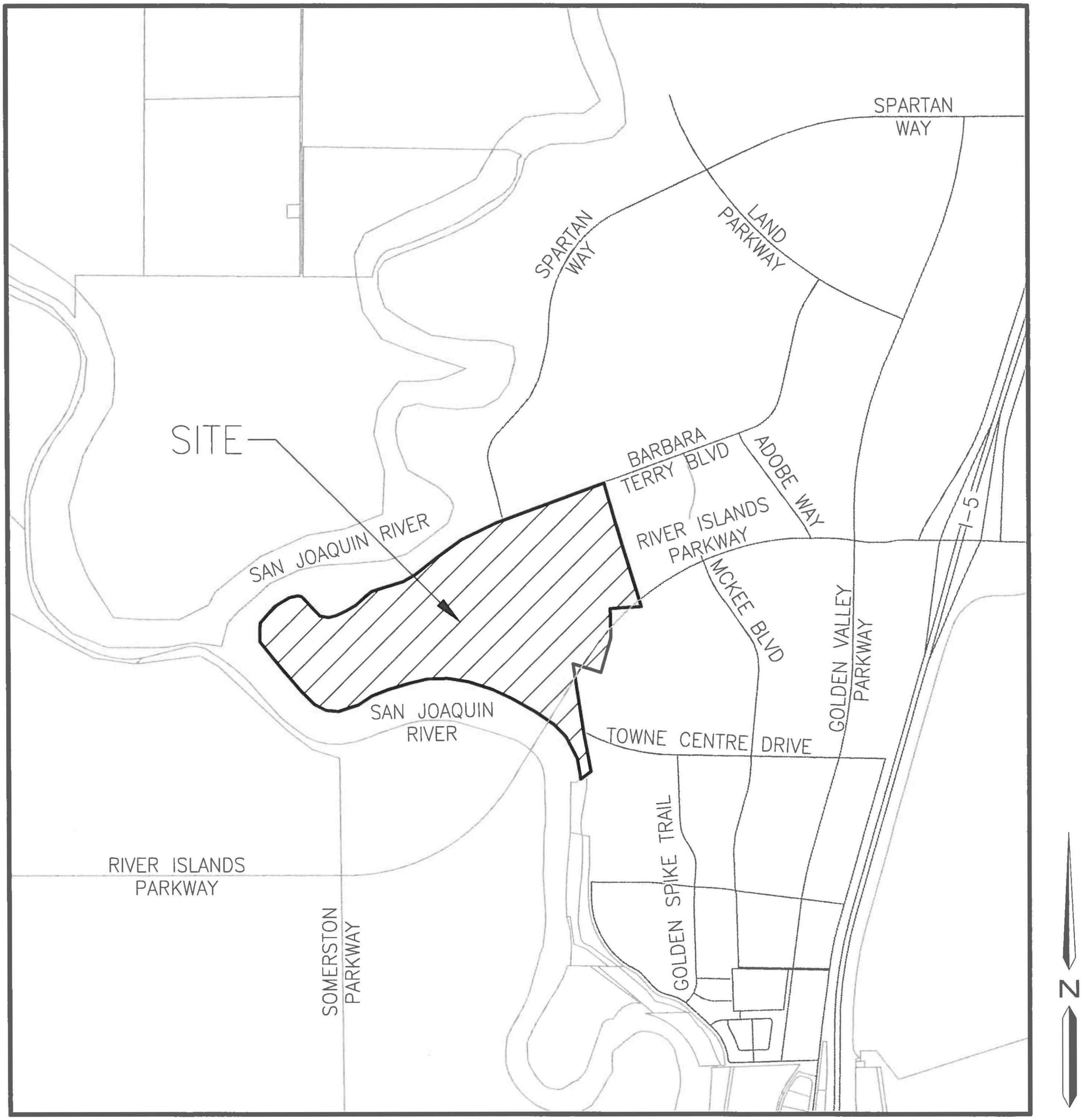
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

Muwekma Ohlone Indian Tribe of the SF Bay Area
Attn: Monica Arellano, Vice Chairwomen
20885 Redwood Road, Suite 232
Castro Valley, CA 94546

RE: SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

To Whom It May Concern:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

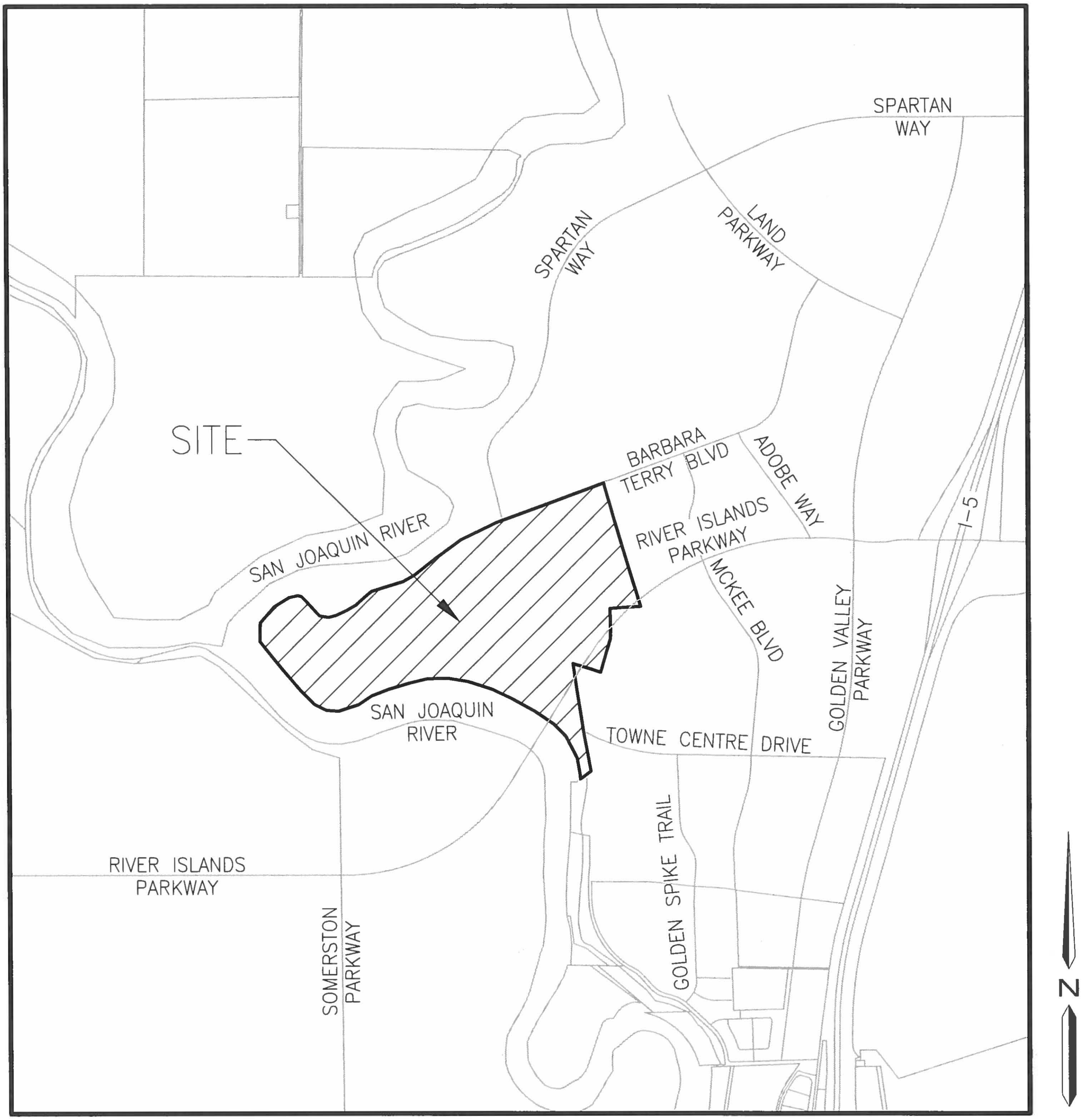
Government Code Sections 65352 and 65352.3 (SB 18)
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

Tule River Indian Tribe
Attn: Ms. Kerri Vera, Environmental Department
P.O. Box 589
Porterville, CA 93258

RE: SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Mr. Vera:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

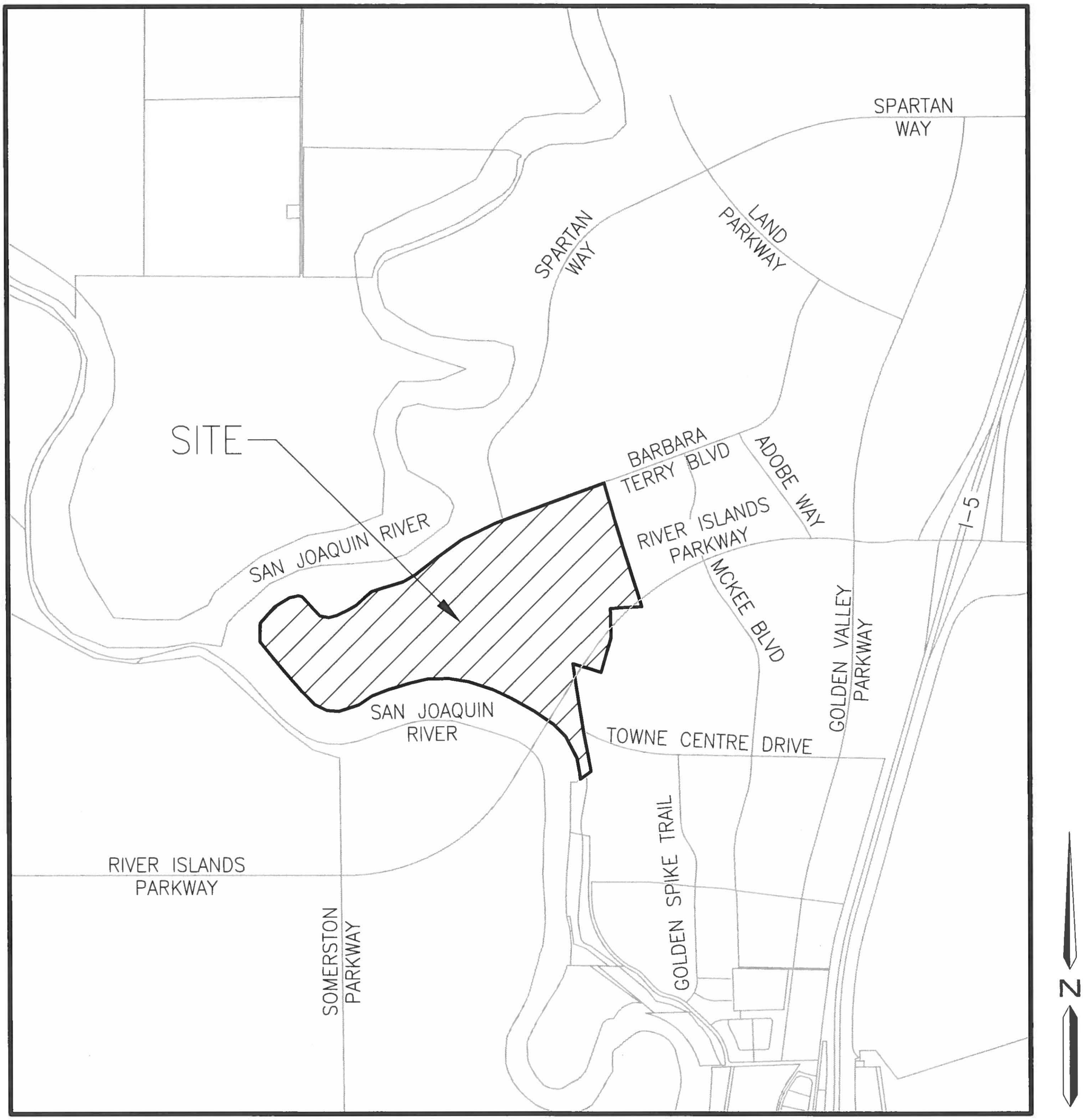
Government Code Sections 65352 and 65352.3 (SB 18)
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

Tule River Indian Tribe
Attn: Mr. Neil Peyron, Chairperson
P.O. Box 589
Porterville, CA 93258

RE: SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Mr. Peyron:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Government Code Sections 65352 and 65352.3 (SB 18)

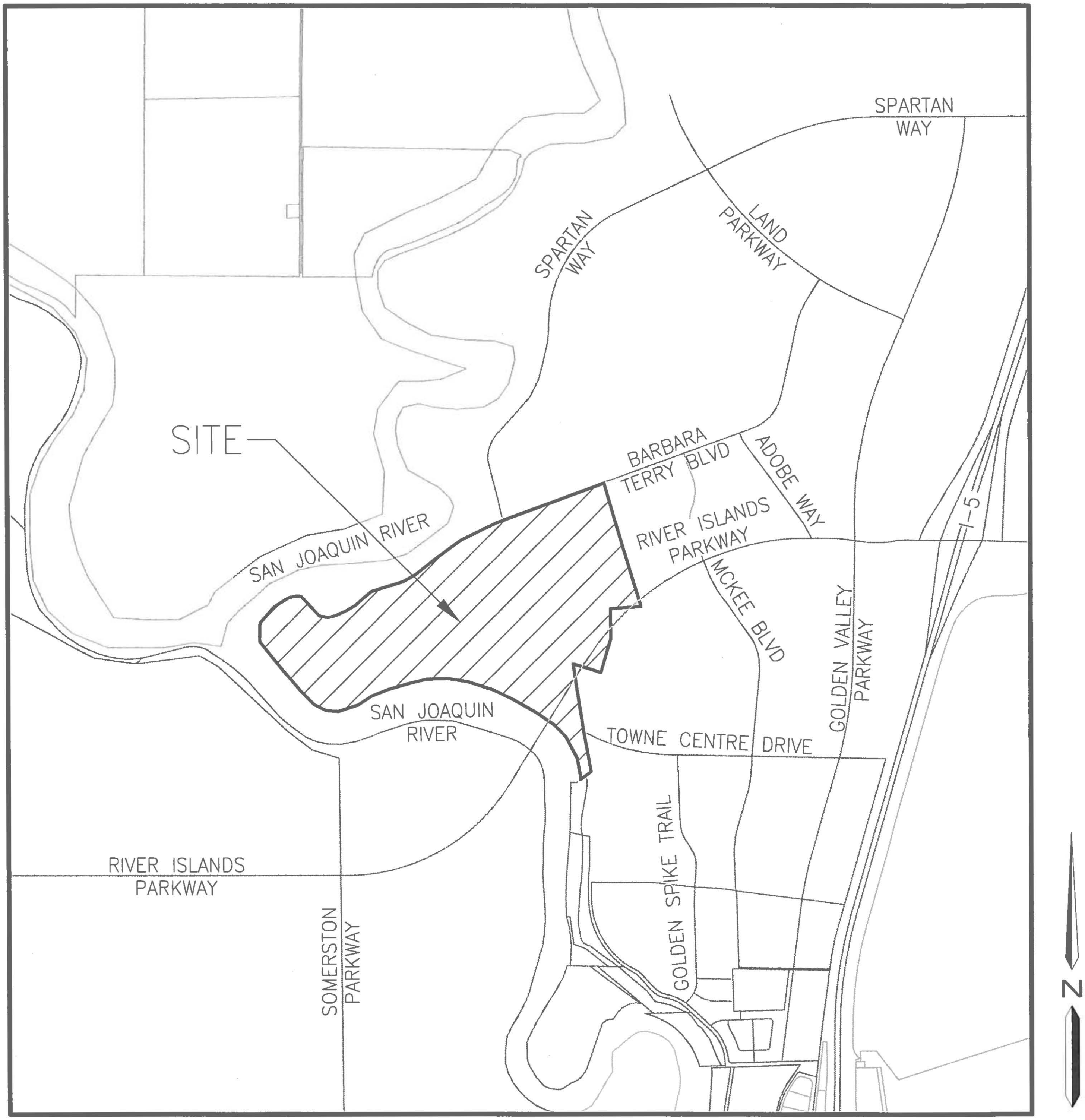
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

Tule River Indian Tribe
Attn: Mr. Joey Garfield, Tribal Archaeologist
P.O. Box 589
Porterville, CA 93258

RE: SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Mr. Garfield:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Government Code Sections 65352 and 65352.3 (SB 18)

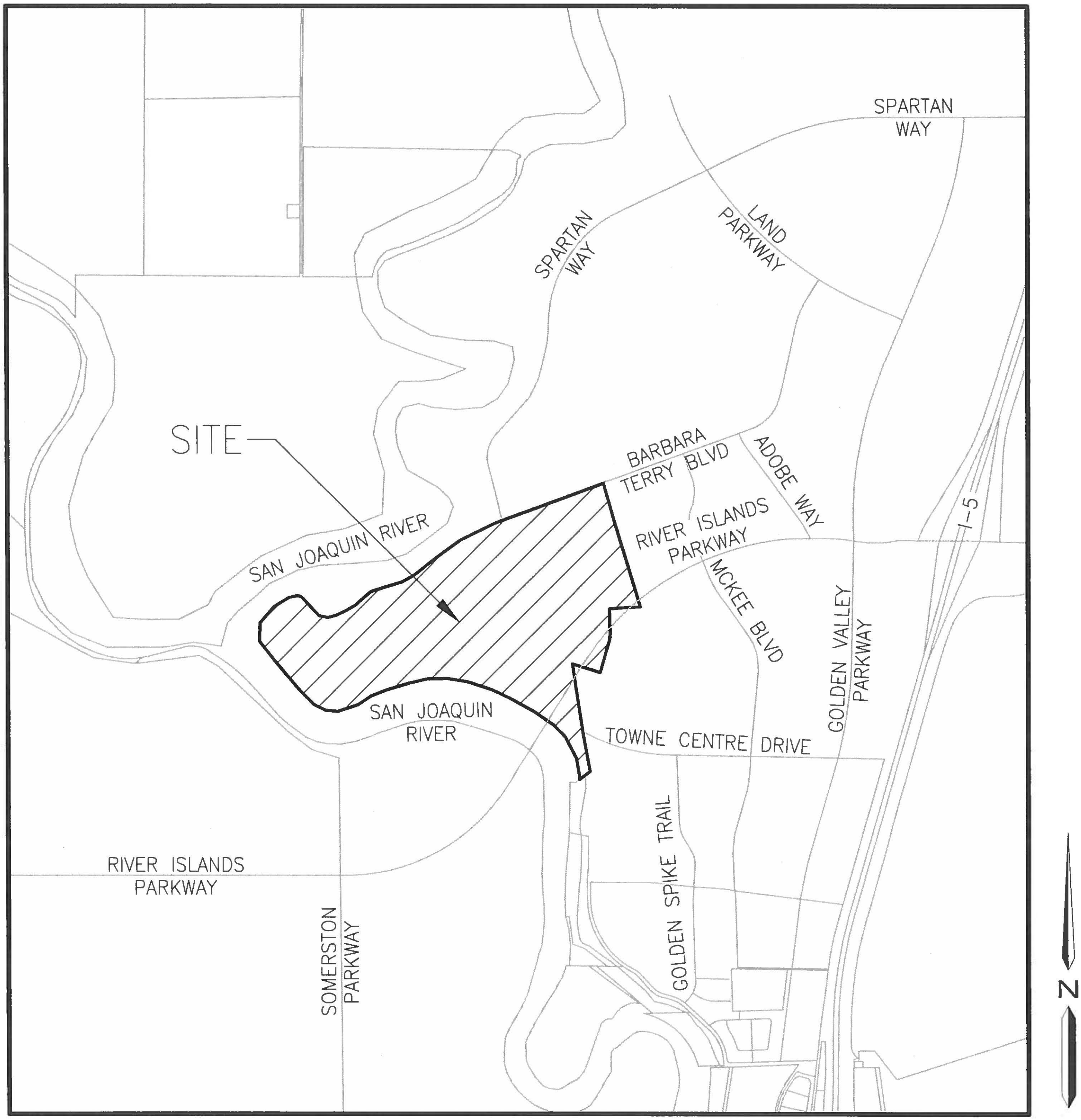
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

Wilton Rancheria
Attn: Mr. Dahlton Brown, Director of Administration
9728 Kent Street
Elk Grove, CA 95624

RE: SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Mr. Brown:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42’x80’, 42’x85’, 50’x80’, and 50’x100’. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Government Code Sections 65352 and 65352.3 (SB 18)

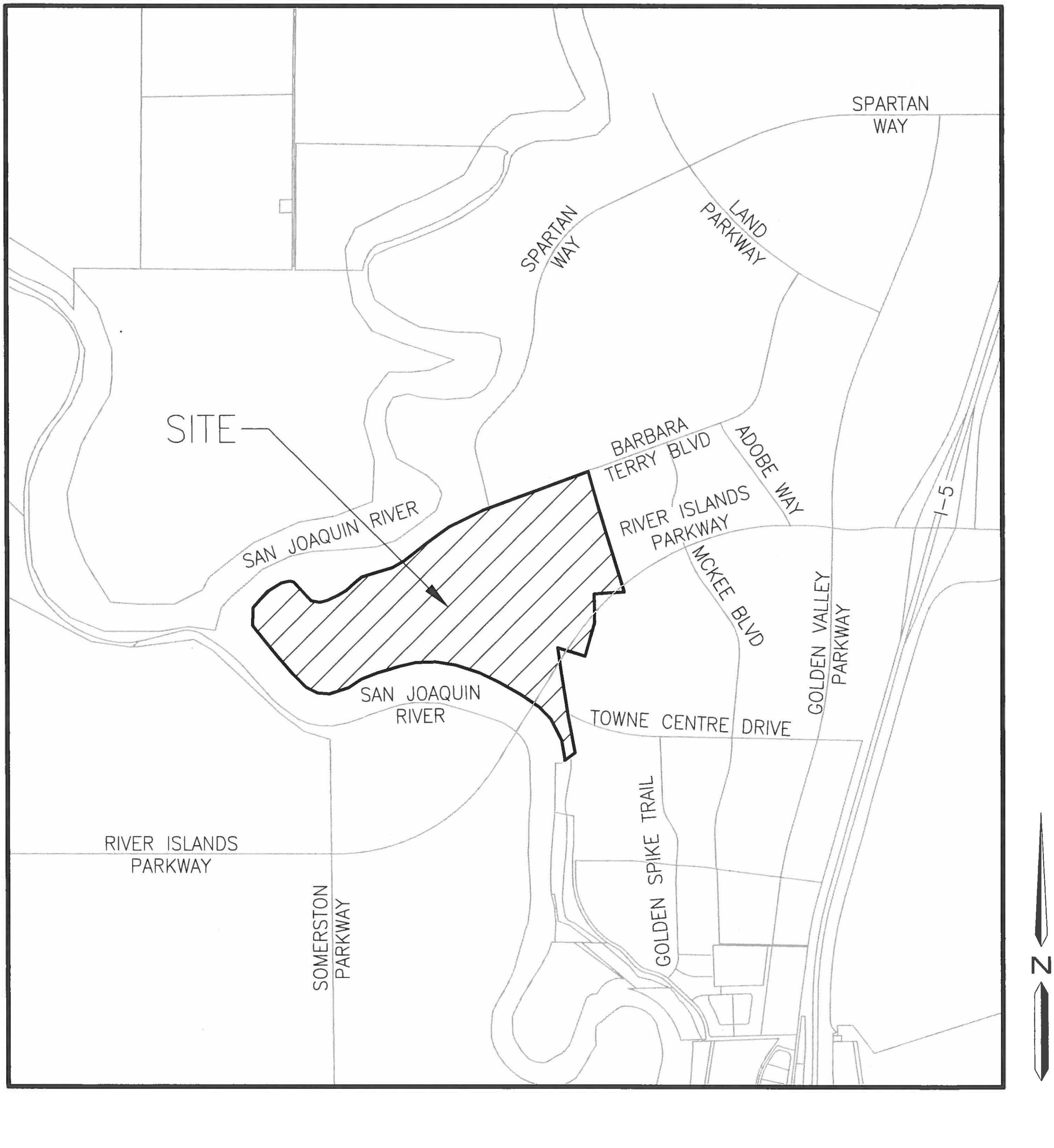
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government’s jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

Wilton Rancheria
Attn: Mr. Jesus Tarango, Chairperson
9728 Kent Street
Elk Grove, CA 95624

RE: SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Mr. Tarango:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

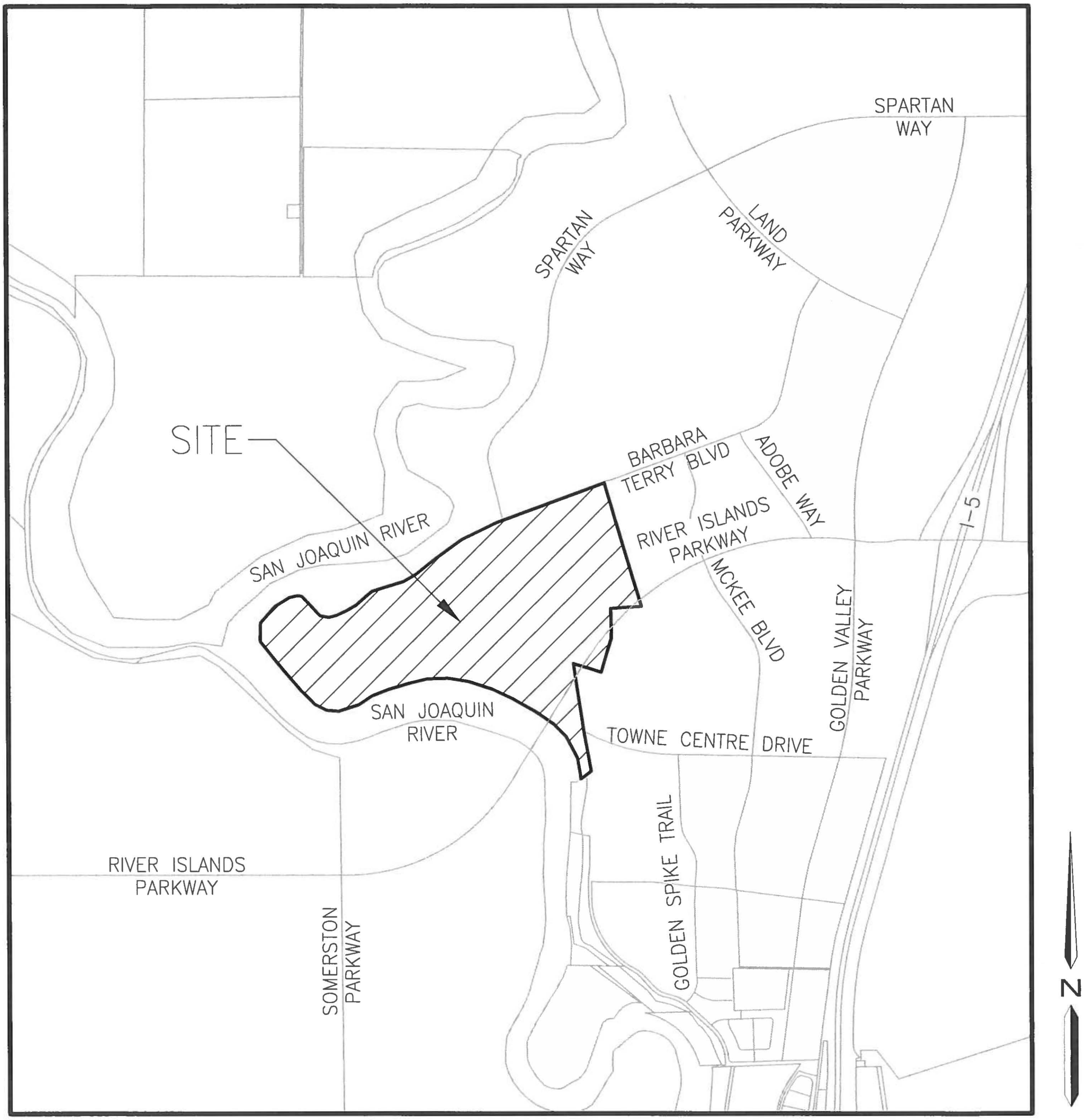
Government Code Sections 65352 and 65352.3 (SB 18)
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

Wilton Rancheria
Attn: Mr. Steven Hutchason, THPO
9728 Kent Street
Elk Grove, CA 95624

RE: SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Mr. Hutchason:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Government Code Sections 65352 and 65352.3 (SB 18)

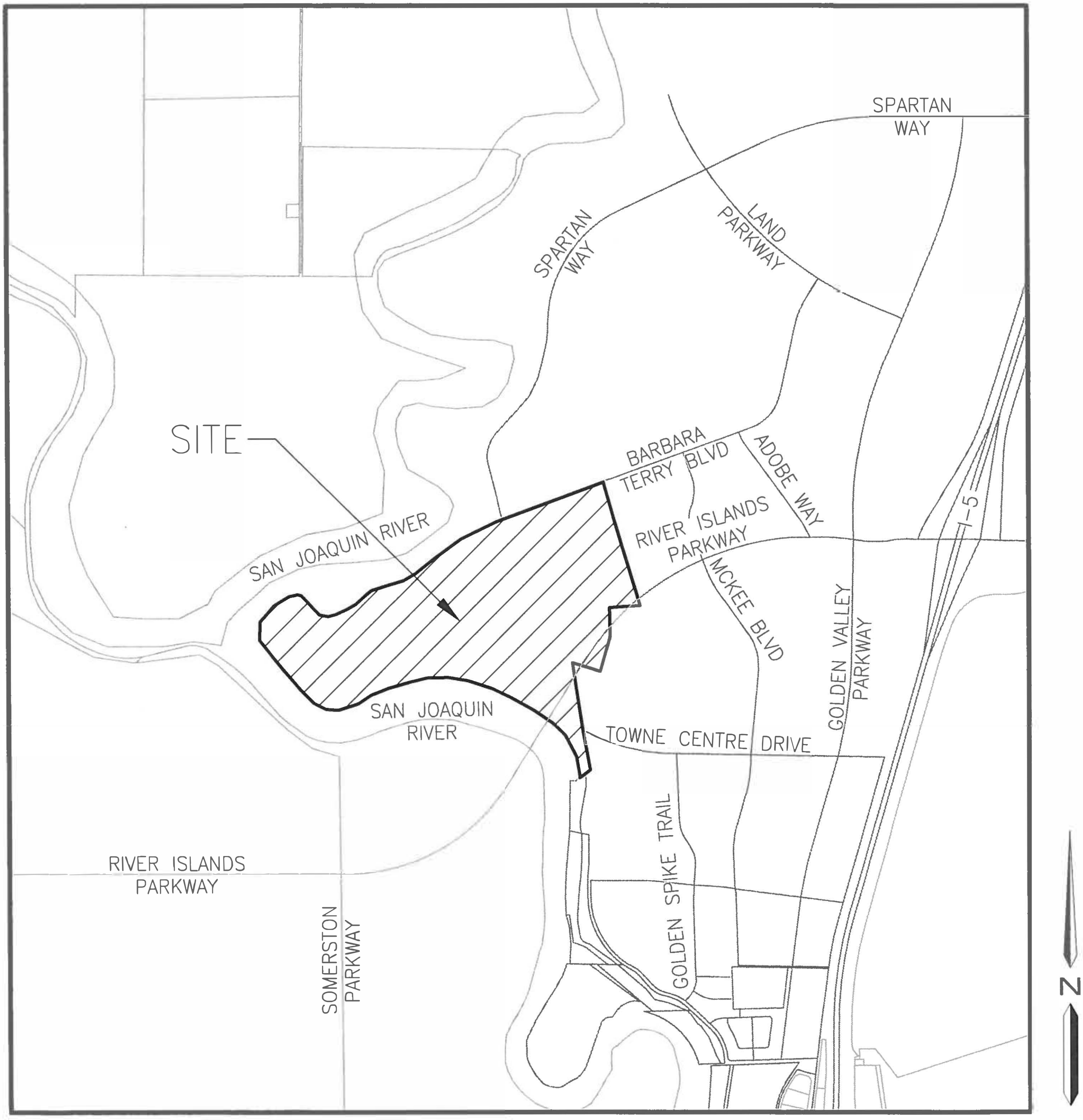
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

December 13, 2023

Wuksache Indian Tribe/Eshom Valley Band
Attn: Kenneth Woodrow, Chairperson
1179 Rock Haven Court
Salinas, CA 93906

RE: SB 18 Notice for the Mossdale Landing West Project, Lathrop, CA. Specific Plan No. SPA-22-25, Vesting Tentative Subdivision Map No. VTM-22-29, Williamson Act Cancellation No. WAC-22-28, and Development Agreement No. DA-22-29.

Dear Mr. Woodrow:

This is to notify you that the City of Lathrop will be initiating environmental review under California Environmental Quality Act (CEQA) for the Mossdale Landing West Project located at 777 Towne Centre Drive (APNs: 191-190-01, -72, 191-610-02, -22, 191-610-59, and 191-340-03). Please refer to the attached Vicinity Map for the geographic location of the project site.

The project includes a Specific Plan, a Vesting Tentative Subdivision Map, a Williamson Act Cancellation, and a Development Agreement to allow for the subdivision of the 205.9-acre project site into 829 single-family residential lots. Mossdale Landing West is bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The project will include four (4) lot size categories: 42'x80', 42'x85', 50'x80', and 50'x100'. The project will feature two (2) park areas: a 6.2-acre neighborhood park near the center of the subdivision, and a 30-foot wide, 5.5-acre linear park along the western border of the project site, adjacent to the Reclamation District 17 (RD 17) levee along the San Joaquin River.

Government Code Sections 65352 and 65352.3 (SB 18)

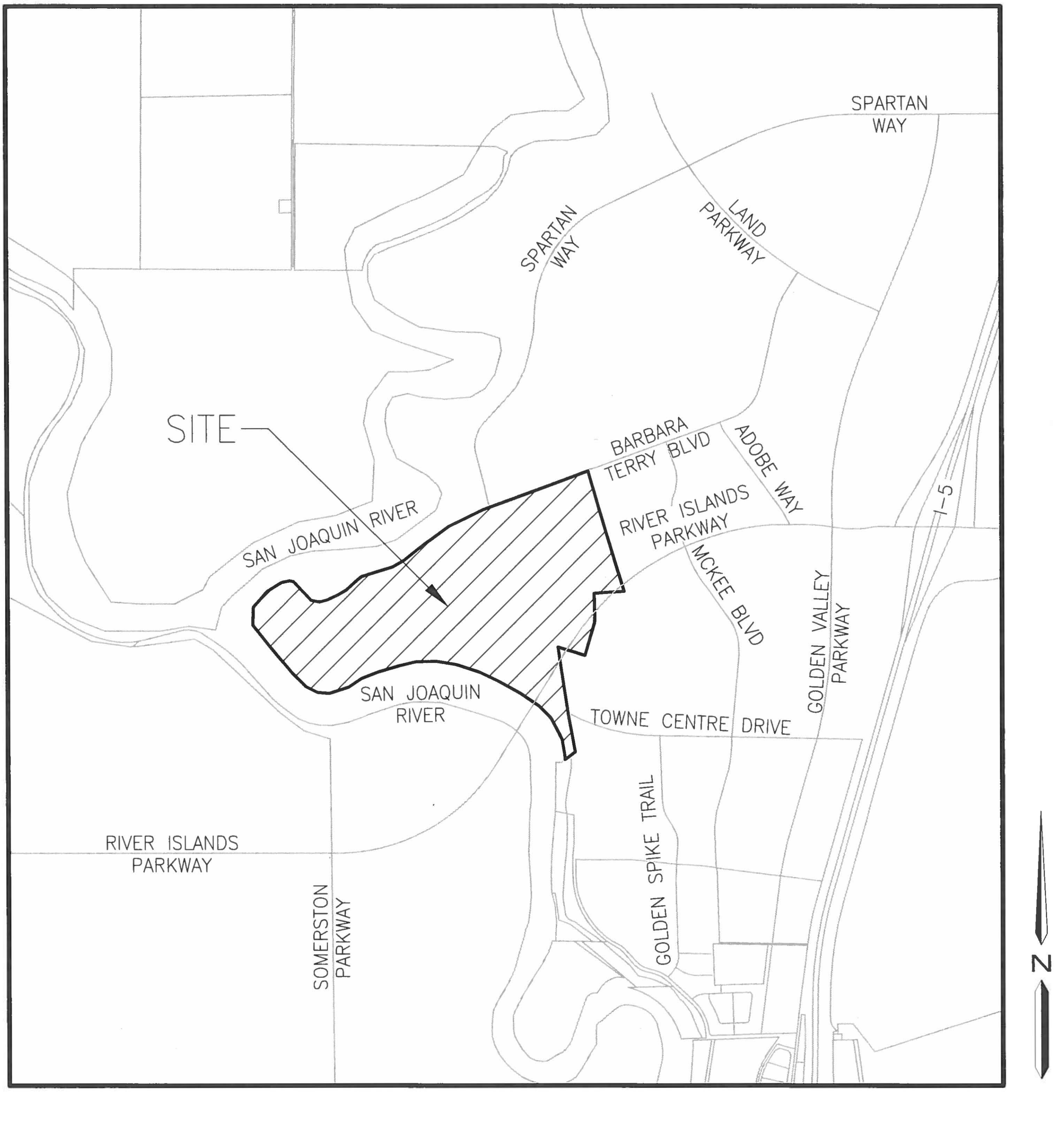
The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans to, and consult with tribes. Prior to the adoption or any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment.

Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe (Government Code §65352.3). In accordance with Government Code Section §65352.3, you have 90 days from the receipt of this letter to request consultation in writing for this project.

Respectfully,

Rick Caguiat
Community Development Director
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7296
E-mail: rcaguiat@ci.lathrop.ca.us

Enclosure: Vicinity Map for the Mossdale Landing West Project



VICINITY MAP

N.T.S.

David Niskanen

From: David Niskanen
Sent: Monday, January 22, 2024 10:31 AM
To: 'cvltribe@gmail.com'
Cc: 'David Niskanen'; John Anderson; 'Ricardo Caguiat'; 'James Michaels'
Subject: RE: [**EXTERNAL**] AB 52/SB18 Mossdale Landing West Project Lathrop CA

Hi Francis,

Thank you for the email and hope all is well. The Mossdale Landing West Project will require preparation of an Environmental Impact Report (EIR) and the City is under contract with De Novo Planning Group for preparation of the EIR and technical studies, including a Cultural Resources Study by Peak & Associates. As such, the final CHRIS and EIR (including the Cultural Resources Study) for the project are not available yet. De Novo Planning is currently preparing the Notice of Preparation (NOP) for the project.

We're happy to notify you of when the EIR is available for review/comment.

Thanks,

David Niskanen **I J. B. Anderson Land Use Planning**
139 S. Stockton Avenue, Ripon, California 95366 I 209/599-8377

J.B. ANDERSON
LAND USE PLANNING

From: Rick Caguiat <rcaguiat@ci.lathrop.ca.us>
Sent: Friday, January 19, 2024 3:44 PM
To: 'Lisjan Nation' <cvltribe@gmail.com>; 'David Niskanen' <david@jbandersonplanning.com>
Cc: David Niskanen <planningconsultant@ci.lathrop.ca.us>; John Anderson <john@jbandersonplanning.com>
Subject: RE: [**EXTERNAL**] AB 52/SB18 Mossdale Landing West Project Lathrop CA

Hello Francis,

We can certainly provide information we have available.

David: please see request below and also provide an overview of the EIR status for the project.

Thanks,

RICK CAGUIAT
Director | Community Development Department
City of Lathrop | 390 Towne Centre Dr. Lathrop, CA 95330
O: (209) 941-7290 | D: (209) 941-7296
rcaguiat@ci.lathrop.ca.us

From: Lisjan Nation <cvltribe@gmail.com>
Sent: Friday, January 19, 2024 12:16 PM
To: Rick Caguiat <rcaguiat@ci.lathrop.ca.us>
Subject: [**EXTERNAL**] AB 52/SB18 Mossdale Landing West Project Lathrop CA

Hello,

Thank you for your email. The Tribe is requesting a copy of the final CHRIS and EIR for this project, along with the SLF from Native American Heritage Commission and any additional archeological reports. Our physical address is: PO BOX 6487 Oakland CA 94603 or if you would prefer to send them electronically, please send them to this email address.

'Uni (Respectfully),

Francis Ranstead
Confederated Villages of Lisjan Nation Tribal Administrative Assistant

CITY OF LATHROP
MOSSDALE LANDING WEST PROJECT
SPA-22-25, VTM-22-29, WAC-22-28, AND DA-22-29
SENATE BILL 18 CONSULTATION MEETING
JANUARY 30, 2024 MEETING
PREPARED JANUARY 30, 2024

MEETING PARTICIPANTS

City of Lathrop
Rick Caguiat, Community Dev. Director
James Michaels, Senior Planner

Wilton Rancheria
Venesa Kremer, Lead Monitor

J.B. Anderson Land Use Planning
David Niskanen, Senior Planner
Brad Wall, Senior Planner

MEETING SUMMARY

The following are summary notes from the Senate Bill 18 (SB 18) Consultation Meeting with Ms. Venesa Kremer, Lead Monitor of Wilton Rancheria.

Following introductions, Venesa stated that the tribe's internal records show that the project site is located within a sensitive area, referencing an internal map that shows records of four (4) sites (discussed further below) located within the project area.

David provided an overview of the project, stating that the project includes a Specific Plan and Vesting Tentative Subdivision Map to subdivide the property into 829 single-family lots. David further stated that the project will include preparation of an Environmental Impact Report (EIR) by De Novo Planning Group and that a Cultural Study will be prepared by Peak & Associates as a sub-consultant to De Novo Planning Group. The environmental process is still in its early stages and the Notice of Preparation (NOP) is currently being prepared.

Venesa recommended that the tribe be part of the site survey for the Cultural Study by Peak & Associates and referenced that the tribe does on-site tribal monitoring and Cultural Sensitivity Training (discussions with construction staff) prior to construction.

Rick provided an overview of development in the area, referencing the Mossdale Landing Project and development other that has occurred over the years. Rick further stated that the project is actively farmed, with a recent tomato harvest completed last year. Rick added that the project is under a Williamson Act and that the property owner filed a Notice of Non-Renewal and that the Cancellation will occur as part of this project.

Venesa stated that she appreciated the background of the project and area. The tribe has been involved in other projects and made reference to being involved in testing prior to the kick-off of the project (construction) with “shovel ready testing” and a “K-9 crew”.

Rick asked if Melinda Peak (Peak & Associates) would have access to the tribe's files as part of the preparation of the Cultural Study. Venessa responded that the Native American Heritage Commission (NAHC) may provide information related to the Sacred Land File (SLF).

Venessa stated that, according to the tribe's files, there are four (4) sites located within the project boundary: one (1) historic and three (3) tribal. The number is based on historic findings at the site, whether small or large.

Rick stated that this information would be helpful in the Peak & Associates preparation of the Cultural Study. David added that there may have been some field work completed by Peak & Associates at this point. Venesa stated that she would provide a map and discussion points that were brought up in today's meeting.

Rick stated that the map and discussion points would be helpful for the file and to send to the CEQA consultant. Venesa stated that some projects add "tiny shout outs" such as architectural details and specific landscaping that provide some historical reference to the tribe that habited the area. She added that she has been involved in Pedestrian Surveys in other projects, which includes working side-by-side with the Cultural Consultant (Peak & Associates) during the site survey and historical research for the project.

The meeting concluded with a couple of action items:

1. Venessa to provide map and summary of comments discussed during the meeting to City staff.
2. David to reach out to the CEQA Consultant to discuss the status of the Cultural Study and inform them about the discussion with Venesa.

The City will also keep Venesa up to date on the status of the project.

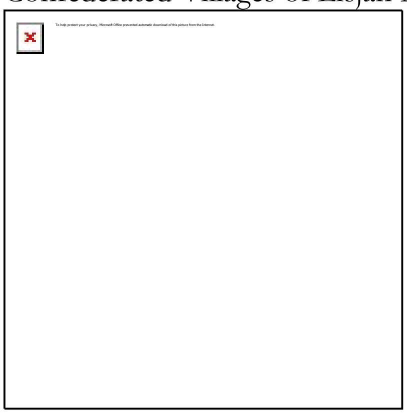
David Niskanen

From: Lisjan Nation <cvltribe@gmail.com> on behalf of Lisjan Nation
Sent: Thursday, February 22, 2024 2:50 PM
To: David Niskanen
Subject: Re: [**EXTERNAL**] AB 52/SB18 Mossdale Landing West Project Lathrop CA

Thank you.
Please send over documents when they are ready.

'Uni (Respectfully),

Francis Ranstead, Tribal Administrative Assistant
Confederated Villages of Lisjan Nation



On Mon, Jan 22, 2024 at 10:31 AM David Niskanen <david@jbandersonplanning.com> wrote:

> Hi Francis,
>
> Thank you for the email and hope all is well. The Mossdale Landing West Project will require preparation of an Environmental Impact Report (EIR) and the City is under contract with De Novo Planning Group for preparation of the EIR and technical studies, including a Cultural Resources Study by Peak & Associates. As such, the final CHRIS and EIR (including the Cultural Resources Study) for the project are not available yet. De Novo Planning is currently preparing the Notice of Preparation (NOP) for the project.
>
> We're happy to notify you of when the EIR is available for review/comment.
>
> Thanks,

David Niskanen **▌J. B. Anderson Land Use Planning**

139 S. Stockton Avenue, Ripon, California 95366 ▌209/599-8377

From: Rick Caguiat <rcaguiat@ci.lathrop.ca.us>
Sent: Friday, January 19, 2024 3:44 PM
To: 'Lisjan Nation' <cvltribe@gmail.com>; 'David Niskanen' <david@jbandersonplanning.com>
Cc: David Niskanen <planningconsultant@ci.lathrop.ca.us>; John Anderson <john@jbandersonplanning.com>
Subject: RE: [**EXTERNAL**] AB 52/SB18 Mossdale Landing West Project Lathrop CA

Hello Francis,

We can certainly provide information we have available.

David: please see request below and also provide an overview of the EIR status for the project.

Thanks,

RICK CAGUIAT

Director | Community Development Department

City of Lathrop | 390 Towne Centre Dr. Lathrop, CA 95330

O: (209) 941-7290 | D: (209) 941-7296

rcaguiat@ci.lathrop.ca.us

From: Lisjan Nation <cvltribe@gmail.com>
Sent: Friday, January 19, 2024 12:16 PM

To: Rick Caguiat <rcaguiat@ci.lathrop.ca.us>
Subject: [**EXTERNAL**] AB 52/SB18 Mossdale Landing West Project Lathrop CA

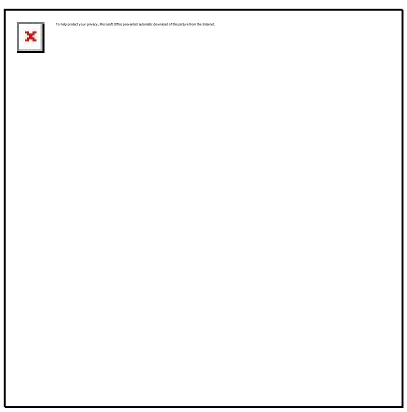
Hello,

Thank you for your email. The Tribe is requesting a copy of the final CHRIS and EIR for this project, along with the SLF from Native American Heritage Commission and any additional archeological reports. Our physical address is: PO BOX 6487 Oakland CA 94603 or if you would prefer to send them electronically, please send them to this email address.

'Uni (Respectfully),

Francis Ranstead

Confederated Villages of Lisjan Nation Tribal Administrative Assistant



City of Lathrop

Community Development Department
Planning Division

390 Towne Centre Drive– Lathrop, CA 95330
Phone (209) 941-7290 – Fax (209) 941-7268
www.ci.lathrop.ca.us

June 12, 2024

Wilton Rancheria
Attn: Ms. Venesa Kremer, Lead Monitor
9728 Kent Street
Elk Grove, CA 95624

Subject: **Consultation under Senate Bill 18 for the Mossdale Landing West Project, Lathrop, California (REZ-22-24, GPA-22-25, SPA-22-26, TSM-22-27, AGC-22-28, and DA-22-29)**

Dear Ms. Kremer:

The California Government Code establishes responsibilities for local governments to contact, provide notice to, refer plans, and to consult with tribes. Prior to the adoption of any amendment of a general plan or specific plan, a local government must notify the appropriate tribes (on the contact list maintained by the NAHC) of the opportunity to conduct consultations for the purpose of preserving, or mitigating impacts to, cultural places located on land within the local government's jurisdiction that is affected by the proposed plan adoption or amendment. For the City of Lathrop, this list includes the Wilton Rancheria tribe. The City mailed a notice regarding the Mossdale Landing West Project on December 13, 2023.

On January 16, 2024, you responded to the City's notice pursuant to Government Code Section 65352.3 requesting a meeting to discuss the project. On January 18, 2024, the City invited you to a teleconference meeting scheduled for January 30, 2024. On January 30, 2024, the City conducted the consultation teleconference and emailed you a summary of the meeting on February 1, 2024. The City has not received any additional communication from you or another representative from the Wilton Rancheria tribe since the January 30, 2024 meeting. Given the lack of communication, the City of Lathrop is continuing with processing of the proposed Project. The City will provide notice of the Draft Environmental Impact Report (DEIR) when released for the 45-day public review period, referral(s) pursuant to Government Code Section 65352(a)(8) and Public Hearing notices pursuant to Government Code Section 65092.

Should you have any questions, please do not hesitate to contact me directly at (209) 941-7296 or by email at rcaguiat@ci.lathrop.ca.us.

Very Respectfully,

Rick Caguiat,
Community Development Director

cc. Mossdale Landing West Project File

APPENDIX D

Environmental Noise Assessment Appendices

Environmental Noise Assessment

Mossdale West TM Lathrop

City of Lathrop, California

July 17, 2024

Project #220711

Prepared for:

DE NOVO PLANNING GROUP

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, California 95762

Prepared by:

Saxelby Acoustics LLC

Luke Saxelby, INCE Bd. Cert.
Principal Consultant
Board Certified, Institute of Noise Control Engineering (INCE

(916) 760-8821
www.SaxNoise.com | Luke@SaxNoise.com
915 Highland Pointe Drive, Suite 250
Roseville, CA 95678

Table of Contents

List of Figures

List of Tables

Appendices

INTRODUCTION

The Mossdale West TM Lathrop project consists of the development of a single-family subdivision in the City of Lathrop, California. The project site is bounded by Barbara Terry Boulevard to the north, single family residential uses to the east, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. **Figures 1 and 2** show the project site plan and proposed community sound wall locations. **Figure 3** shows an aerial photo of the project site and noise measurement locations.

ENVIRONMENTAL SETTING

BACKGROUND INFORMATION ON NOISE

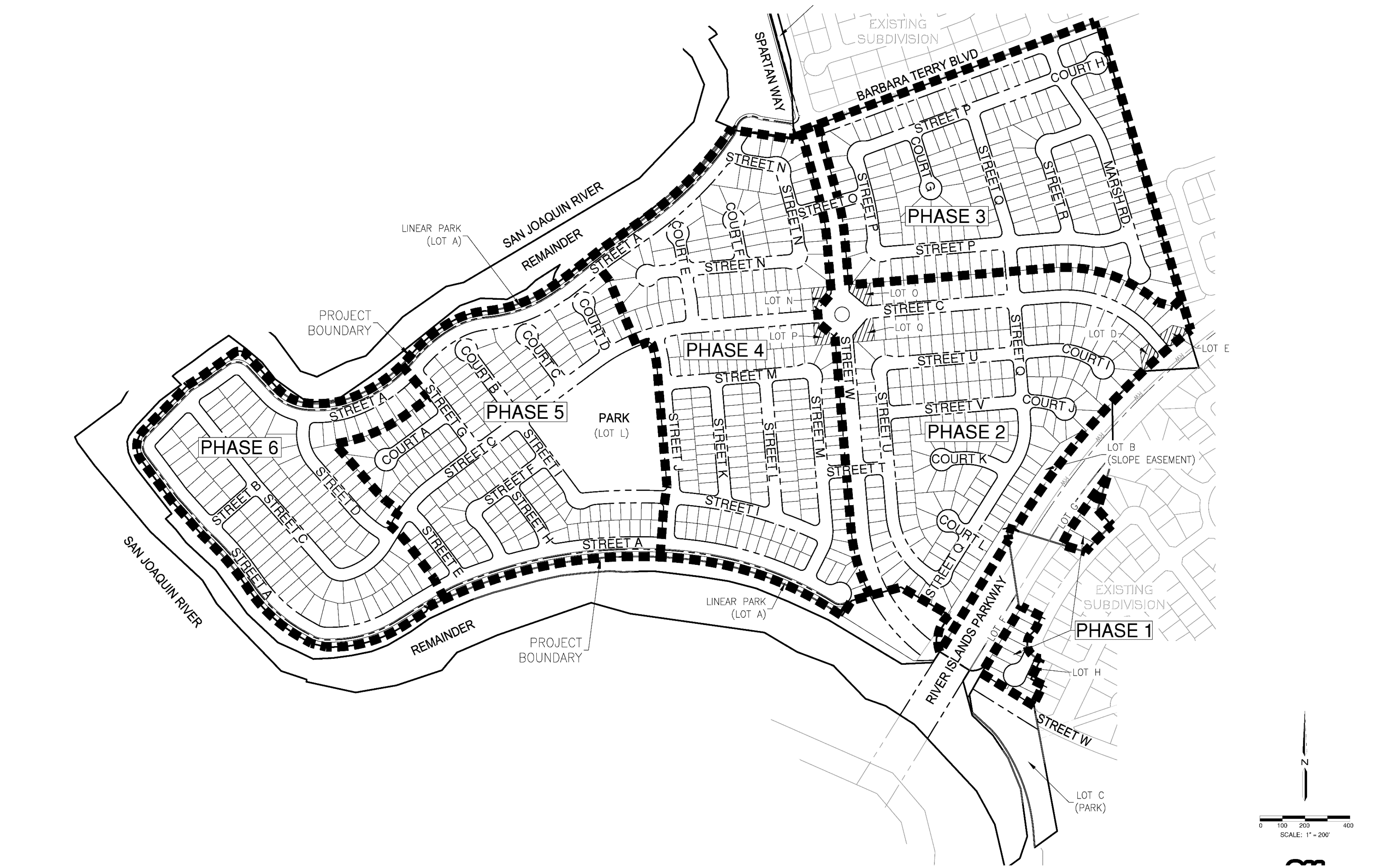
Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.

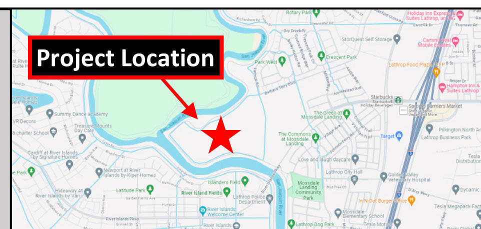


Mossdale West

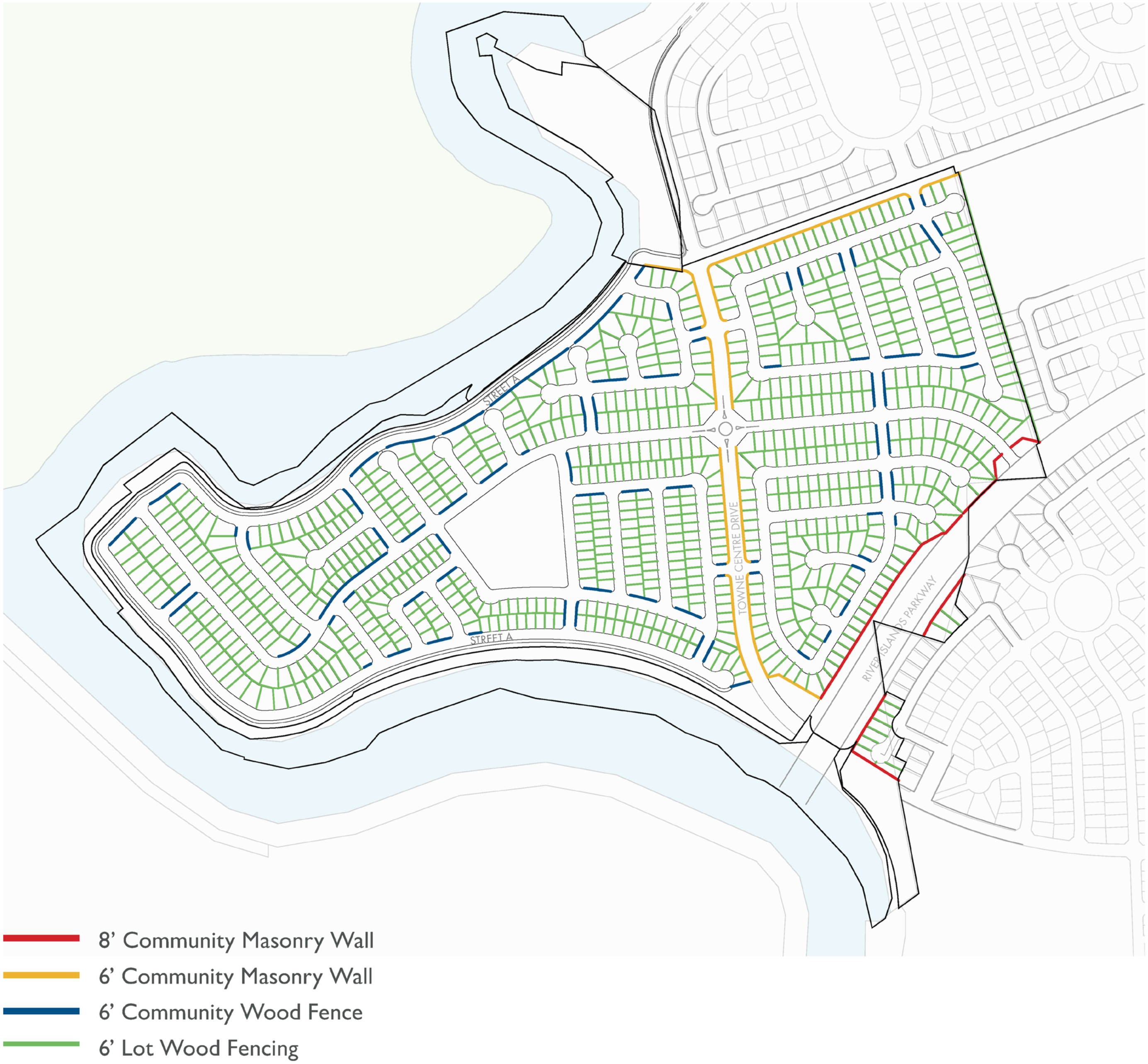
City of Lathrop, California

Figure 1

Project Site Plan



SAXELBY ACOUSTICS
Acoustics • Noise • Vibration



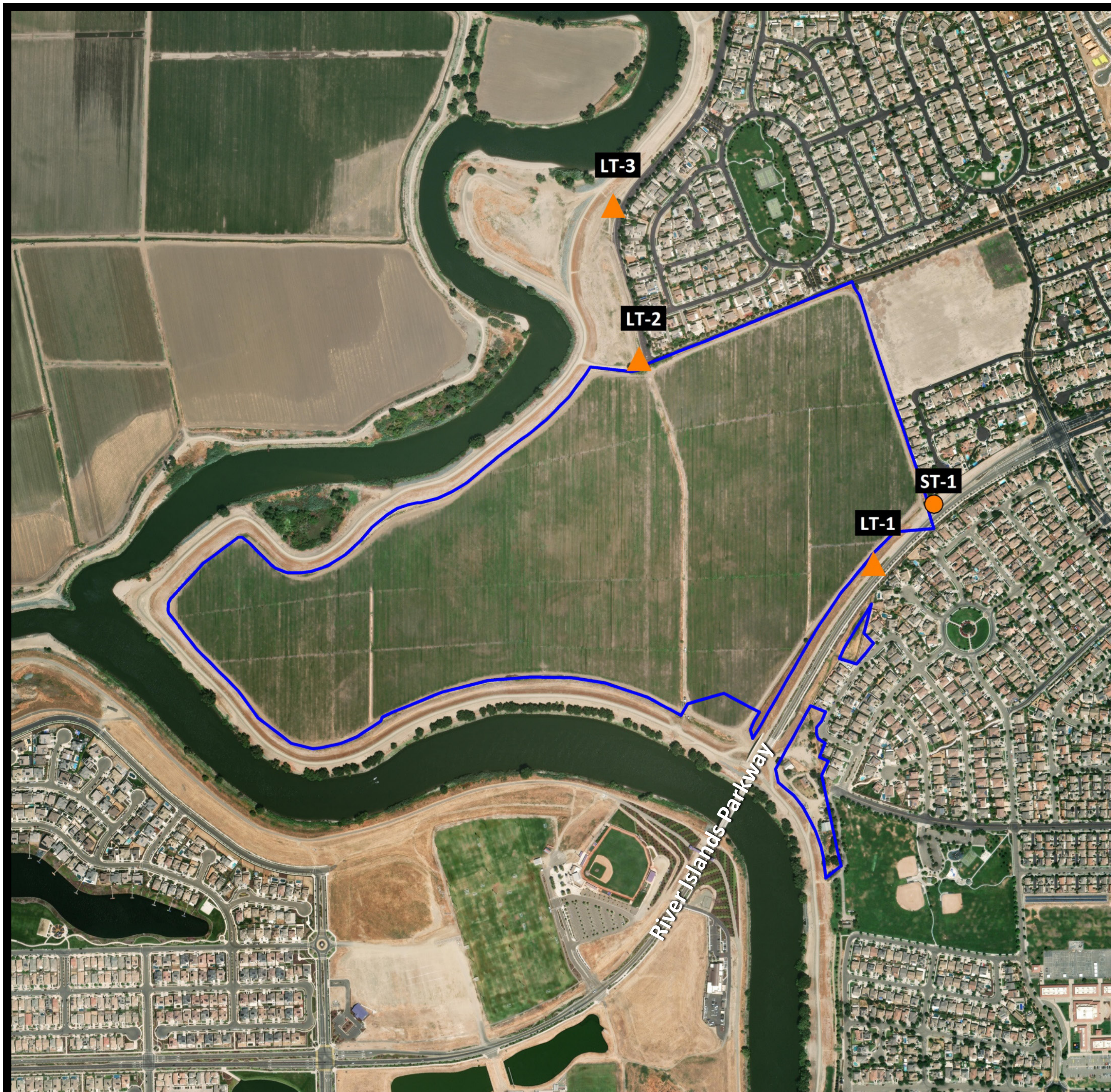
Mossdale West

City of Lathrop, California

Figure 2

Proposed Sound Wall Locations

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration



Mossdale West

City of Lathrop, California

Figure 3

Noise Measurement Sites

Legend

Project Site

Noise Measurement - Long Term

Noise Measurement - Short Term

0.0 mi 0.5 mi 1.0 mi 1.5 mi 2.0 mi

Projection: UTM Zone 10 / WGS84 / meters
Rev. Date: 03/25/2024

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

The decibel scale is logarithmic, not linear. In other words, two sound levels 10-dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10-dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (DNL or L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of the noise levels associated with common situations. **Appendix A** provides a summary of acoustical terms used in this report.

TABLE 1: TYPICAL NOISE LEVELS

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft.)	--100--	
Gas Lawn Mower at 1 m (3 ft.)	--90--	
Diesel Truck at 15 m (50 ft.), at 80 km/hr. (50 mph)	--80--	Food Blender at 1 m (3 ft.) Garbage Disposal at 1 m (3 ft.)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft.)	--70--	Vacuum Cleaner at 3 m (10 ft.)
Commercial Area Heavy Traffic at 90 m (300 ft.)	--60--	Normal Speech at 1 m (3 ft.)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. September, 2013.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as hearing loss or sudden startling

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1-dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise–including stationary mobile sources such as idling vehicles–attenuate (lessen) at a rate of approximately 6-dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING AND FUTURE NOISE AND VIBRATION ENVIRONMENTS

EXISTING NOISE RECEPTORS

Some land uses are considered more sensitive to noise than others. Land uses often associated with sensitive receptors generally include residences, schools, libraries, hospitals, and passive recreational areas. Noise sensitive land uses are typically given special attention in order to achieve protection from excessive noise.

Sensitivity is a function of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities involved. In the vicinity of the project site, sensitive land uses include existing single-family residential uses located north, east, and south of the project site. The River Islands Technology Academy is located approximately one-half mile from the southern boundary of the project site.

EXISTING GENERAL AMBIENT NOISE LEVELS

The existing noise environment in the project area is primarily defined by traffic on River Islands Parkway. To quantify the existing ambient noise environment in the project vicinity, Saxelby Acoustics conducted a continuous (24-hr.) noise level measurement on the project site and a short-term noise level measurement at one location. Noise measurement locations are shown on **Figure 3**. A summary of the noise level measurement survey results is provided in **Table 2**. **Appendix B** contains the complete results of the noise monitoring.

The sound level meters were programmed to record the maximum, median, and average noise levels at each site during the survey. The maximum value, denoted L_{max}, represents the highest noise level measured. The average value, denoted L_{eq}, represents the energy average of all of the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L_{50}, represents the sound level exceeded 50 percent of the time during the monitoring period.

Larson Davis Laboratories (LDL) model 820 and 831 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with a CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

TABLE 2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA

Site	Date	L_{dn}	Daytime L_{eq}	Daytime L_{50}	Daytime L_{max}	Nighttime L_{eq}	Nighttime L_{50}	Nighttime L_{max}
LT-1: 50 ft. to CL of River Islands Pkwy	8/25/22	69	68	63	85	61	50	76
LT-2: 50 ft. to CL of Lathrop Rd.	3/21/24	49	48	39	66	41	40	51
LT-3: 40 ft. to CL of Lathrop Rd.	3/21/24	51	48	39	69	44	41	60
ST-1: 50 ft. to CL of River Islands Pkwy	8/24/22	N/A	71	65	94	N/A	N/A	N/A

Notes:

- *All values shown in dBA*
- *Daytime hours: 7:00 a.m. to 10:00 p.m.*
- *Nighttime Hours: 10:00 p.m. to 7:00 a.m.*
- *Source: Saxelby Acoustics 2024*

FUTURE TRAFFIC NOISE ENVIRONMENT AT OFF-SITE RECEPTORS

OFF-SITE TRAFFIC NOISE IMPACT ASSESSMENT METHODOLOGY

To assess noise impacts due to project-related traffic increases on the local roadway network, traffic noise levels are predicted at sensitive receptors for Existing, Baseline, and Cumulative conditions.

Noise levels due to traffic are calculated using the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108). The model is based upon the Calveno reference noise factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site.

The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions. To predict traffic noise levels in terms of L_{dn}, it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Project trip generation volumes were provided by the project traffic engineer (TJKM 2024), truck usage and vehicle speeds on the local area roadways were estimated from field observations. The predicted increases in traffic noise levels on the local roadway network for Existing, Baseline, and Cumulative conditions which would result from the project are provided in terms of L_{dn}.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations, sensitive receptors may not receive full shielding from noise barriers or may be located at distances which vary from the assumed calculation distance.

Tables 3-5 summarize the modeled traffic noise levels at the nearest sensitive receptors along each roadway segment in the Project area. **Appendix C** provides the complete inputs and results of the FHWA traffic noise modeling.

TABLE 3: EXISTING TRAFFIC NOISE LEVELS AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Existing No Project L_{dn} dBA	Existing + Project L_{dn} dBA	Change
Golden Valley Pkwy	South of Spartan Way	62.7	62.8	0.1
Lathrop Rd	North of Barbara Terry Rd	49.7	52.6	2.9
Louise Ave.	East of I-5	66.4	66.5	0.1
McKee Blvd	West of Barbara Terry Blvd	51.6	51.9	0.3
River Islands Pkwy	West of Golden Valley Pkwy	62.6	63.7	1.1
River Islands Pkwy	West of McKee Blvd	57.5	59.1	1.6
River Islands Pkwy	West of Project Street C	55.2	55.6	0.4
Spartan Way	West of Golden Valley Pkwy	58.6	58.8	0.2

Notes: All noise levels include contributions from the roadway segment listed as well as I-5.

TABLE 4: BASELINE TRAFFIC NOISE LEVELS AND PROJECT-RELATED TRAFFIC NOISE LEVEL INCREASES

Roadway	Segment	Baseline No Project L_{dn} dBA	Baseline + Project L_{dn} dBA	Change
Golden Valley Pkwy	South of Spartan Way	63.3	63.4	0.1
Lathrop Rd	North of Barbara Terry Rd	49.9	52.7	2.8
Louise Ave.	East of I-5	67.4	67.6	0.2
McKee Blvd	West of Barbara Terry Blvd	51.6	51.9	0.3
River Islands Pkwy	West of Golden Valley Pkwy	65.2	65.8	0.6
River Islands Pkwy	West of McKee Blvd	60.9	61.7	0.8
River Islands Pkwy	West of Project Street C	58.3	58.4	0.1
Spartan Way	West of Golden Valley Pkwy	59.7	59.9	0.2

Notes: All noise levels include contributions from the roadway segment listed as well as I-5.

Table 5: Cumulative Traffic Noise Levels and Project-Related Traffic Noise Level Increases

Roadway	Segment	Cumulative No Project L_{dn} dBA	Cumulative + Project L_{dn} dBA	Change
Golden Valley Pkwy	South of Spartan Way	64.3	64.4	0.1
Lathrop Rd	North of Barbara Terry Rd	50.9	53.3	2.4
Louise Ave.	East of I-5	68.5	68.6	0.1
McKee Blvd	West of Barbara Terry Blvd	52.6	52.8	0.2
River Islands Pkwy	West of Golden Valley Pkwy	66.4	66.9	0.5
River Islands Pkwy	West of McKee Blvd	62.0	62.7	0.7
River Islands Pkwy	West of Project Street C	59.4	59.6	0.2
Spartan Way	West of Golden Valley Pkwy	60.8	60.9	0.1

Notes: All noise levels include contributions from the roadway segment listed as well as I-5.

Based upon the data in **Tables 3-5**, the proposed project is predicted to result in an increase in a maximum traffic noise level increase of 2.9 dBA.

EVALUATION OF TRANSPORTATION NOISE ON PROJECT SITE

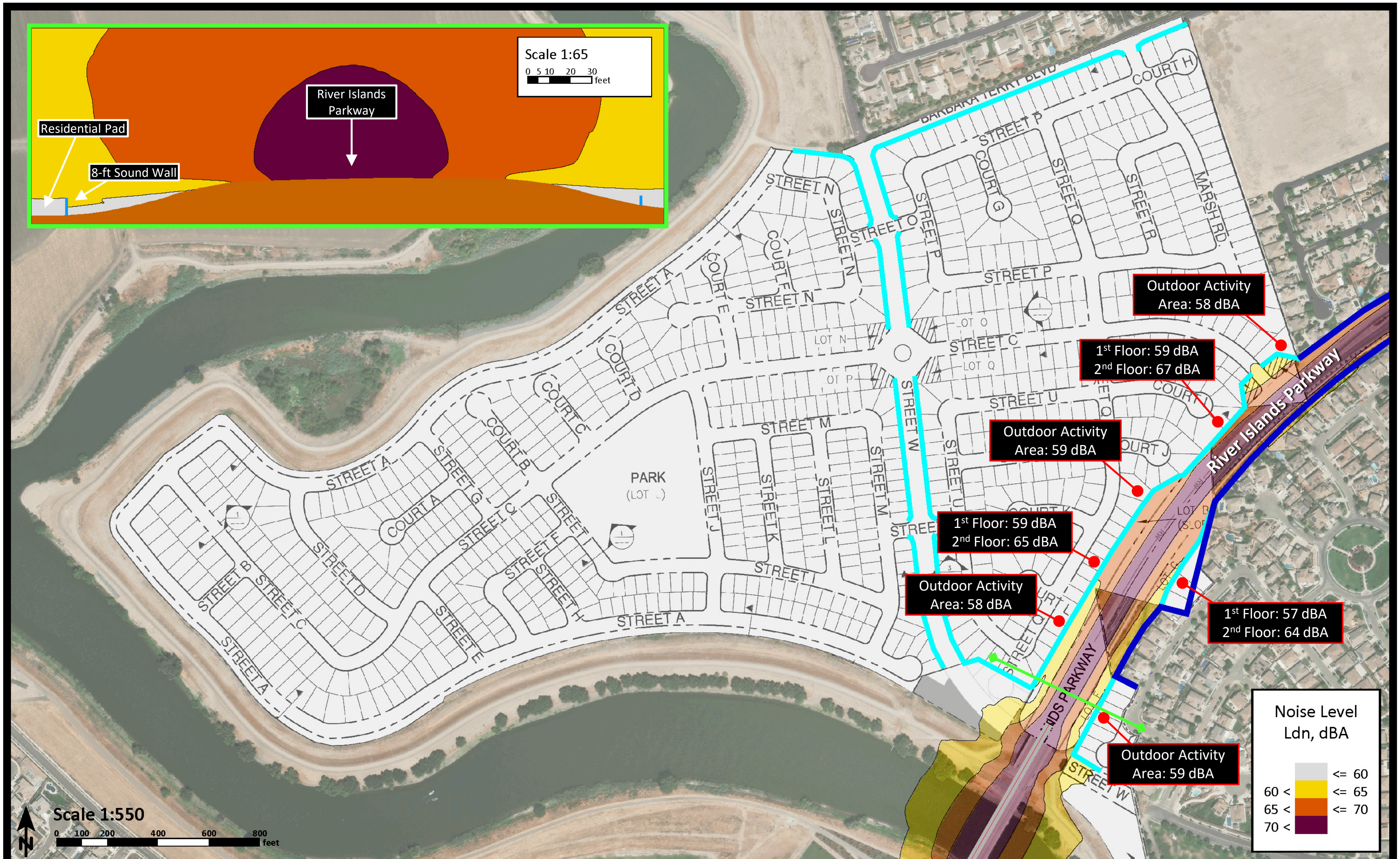
Internal Project Roadways

The primary roadway within the project boundaries will be Street W. Per the Specific Plan, the project is required to construct 6-foot-tall sound walls along Street W. Based upon the project traffic study, it is expected that Street W would have 1,120 daily trips. Saxelby Acoustics analyzed this roadway segment using the FHWA RD-77-108 model to predict noise levels. The roadway is expected to produce noise levels of up to 55 dBA L_{dn} at the outdoor activity areas along Street W. **Appendix D** contains the inputs to this analysis.

Off-Site Transportation Sources

Saxelby Acoustics used the SoundPLAN noise model to calculate traffic noise levels at the proposed single-family residences due to traffic on River Islands Parkway. Inputs to the model included sound levels for the local roadways based upon the ambient noise level survey and projected increases in traffic, existing and proposed structures, topography data, and locations of sensitive receptors. It should be noted that traffic noise levels along River Islands Parkway were projected to increase by +5.4 dBA under Cumulative Plus Project conditions (TJKM 2024). Additionally, it should be noted that the elevation of River Islands Parkway was taken into account; **Figure 4** shows a cross-section view of River Islands Parkway and the adjacent proposed development.

The noise level predictions are made in accordance with International Organization for Standardization (ISO) standard 9613-2:1996 (Acoustics – Attenuation of sound during propagation outdoors). ISO 9613 is the most commonly used method for calculating exterior noise propagation. **Figure 4** shows the predicted transportation noise exposure on the project site.



Mossdale West

City of Lathrop, California

Figure 4

Future Transportation Noise Levels (dBA L_{dn})

Legend

- Project Wall
- Existing Wall
- Cross Section

SAXELBY ACOUSTICS

Acoustics · Noise · Vibration

CONSTRUCTION NOISE ENVIRONMENT

During the construction of the proposed project, including roads, water and sewer lines, and related infrastructure, noise from construction activities would temporarily add to the noise environment in the project vicinity. As shown in **Table 6**, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dB at a distance of 50 feet.

TABLE 6: CONSTRUCTION EQUIPMENT NOISE

Type of Equipment	Maximum Level, dBA at 50 feet
Auger Drill Rig	84
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: *Roadway Construction Noise Model User's Guide*. Federal Highway Administration. FHWA-HEP-05-054. January 2006.

CONSTRUCTION VIBRATION ENVIRONMENT

The primary vibration-generating activities associated with the proposed project would occur during construction when activities such as grading, utilities placement, and road construction occur. **Table 7** shows the typical vibration levels produced by construction equipment.

TABLE 7: VIBRATION LEVELS FOR VARIOUS CONSTRUCTION EQUIPMENT

Type of Equipment	Peak Particle Velocity at 25 feet (inches/second)	Peak Particle Velocity at 50 feet (inches/second)	Peak Particle Velocity at 100 feet (inches/second)
Large Bulldozer	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Small Bulldozer	0.003	0.001	0.000
Auger/drill Rigs	0.089	0.031	0.011
Jackhammer	0.035	0.012	0.004
Vibratory Hammer	0.070	0.025	0.009
Vibratory Compactor/roller	0.210 (Less than 0.20 at 26 feet)	0.074	0.026

Source: *Transit Noise and Vibration Impact Assessment Guidelines.* Federal Transit Administration. May 2006.

REGULATORY CONTEXT

FEDERAL

There are no federal regulations related to noise that apply to the Proposed Project.

STATE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, indicate that a significant noise impact may occur if a project exposes persons to noise or vibration levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels. CEQA standards are discussed more below under the Thresholds of Significance section.

LOCAL

City of Lathrop General Plan

N-1.1 Noise Exposure. Consider the noise compatibility of existing and future development when making land use planning decisions. Require development and infrastructure projects to be consistent with the land use compatibility standards contained in Tables N-1, N-2, and N-3 to ensure acceptable noise exposure levels for existing and future development.

N-1.2 Noise Mitigation. Require new development to mitigate excessive noise to the standards indicated in Tables N-1, N-2, and N-3 through best practices, including building location and orientation, building design features, placement of noise-generating equipment away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant features between noise sources and sensitive receptors, and use of noise-minimizing materials.

N-1.3 Indoor Residential Noise Level. Ensure that new development does not result in indoor noise levels exceeding 45 dBA Ldn for residential uses by requiring the implementation of construction techniques and noise reduction measures for all new residential development.

N-1.4 Acoustical Studies. Require acoustical studies for new discretionary developments and transportation improvements that have the potential to affect existing noise-sensitive uses such as schools, hospitals, libraries, care facilities, and residential areas; and for projects that would introduce new noise-sensitive uses into an area where existing noise levels may exceed the thresholds identified in this element. For projects that are required to prepare an acoustical study, the following stationary and transportation noise source criteria shall be used to determine the significance of those impacts.

A. Stationary and Non-Transportation Noise Sources - A significant impact will occur if the project results in an exceedance of the noise level standards contained in this element, or the project will result in an increase in ambient noise levels by more than 3 dB, whichever is greater.

B. Transportation Noise Sources - 1. Where existing traffic noise levels are less than 60 dB Ldn at the outdoor activity areas of noise-sensitive uses, a +5 dB Ldn increase in roadway noise levels will be considered significant; 2. Where existing traffic noise levels range between 60 and 65 dB Ldn at the outdoor activity areas of noise-sensitive uses, a +3 dB Ldn increase in roadway noise levels will be considered significant; and 3. Where existing traffic noise levels are greater than 65 dB Ldn at the outdoor activity areas of noise-sensitive uses, a + 1.5 dB Ldn increase in roadway noise levels will be considered significant.

TABLE 8: LAND USE COMPATIBILITY STANDARDS (TABLE N-1 OF LATHROP GENERAL PLAN)

Land Use Category	*Community Noise Exposure L_{dn} or CNEL, dB*			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Residential – Low Density Single Family, Duplex, Mobile Homes	< or = 60	55 - 70	70-75	>75
Residential – Multi-Family	< or = 60	60 - 70	70-75	>75
Transient Lodging – Motels, Hotels	< or = 65	60 - 70	70-80	>80
Schools, Libraries, Religious Assemblies, Hospitals, Nursing Homes	< or = 70	60 - 70	70-80	>80
Auditoriums, Concert Halls, Amphitheaters	< or = 70	-	>65	-
Sports Arena, Outdoor Spectator Sports	< or = 75	-	>70	-
Playgrounds, Neighborhood Parks	< or = 70	-	67.5-75	>72.5
Golf Courses, Riding Stables, Water Recreation, Cemeteries	< or = 75	-	70 - 80	>80
Office Buildings, Business Commercial and Professional	< or = 70	67.5 – 72.5	>75	-
Industrial, Manufacturing, Utilities, Agriculture	< or = 75	70 – 80	>75	-

1. Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
2. Conditionally Acceptable – New construction of development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
3. Normally Unacceptable – New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
4. Clearly Unacceptable – New Construction or development should generally not be undertaken.

TABLE 9: MOBILE SOURCE NOISE STANDARDS (TABLE N-2 OF LATHROP GENERAL PLAN)

Land Use[1]	Outdoor Activity Areas[2,3]	Interior Spaces	
		L_{dn}/CNEL, dB	L_{eq}, dB[4]
Residential	60	45	-
Motels/Hotels	65	45	-
Mixed-Use	65	45	-
Hospitals, Nursing Homes	60	45	-
Theaters, Auditoriums	-	-	35
Religious Assemblies	60	-	40
Office Buildings	65	-	45
Schools, Libraries, Museums	70	-	45
Playgrounds, Neighborhood Parks	70	-	-
Industrial	75	-	45
Golf Courses, Water Recreation	70	-	-

1. Where a proposed use is not specifically listed, the use shall comply with the standards for the most similar use as determined by the City.
2. Outdoor activity areas for residential development are considered to be the back yard patios or decks of single family units and the common areas where people generally congregate for multi-family developments. Where common outdoor activity areas for multi-family developments comply with the outdoor noise level standard, the standard will not be applied at patios or decks of individual units provided noise-reducing measures are incorporated (e.g., orientation of patio/deck, screening of patio with masonry or other noise-attenuating material). Outdoor activity areas for non-residential developments are the common areas where people generally congregate, including pedestrian plazas, seating areas, and outside lunch facilities; not all residential developments include outdoor activity areas.
3. In areas where it is not possible to reduce exterior noise levels to achieve the outdoor activity area standard using a practical application of the best noise-reduction technology, an increase of up to 5 dB Ldn over the standard will be allowed provided that available exterior noise reduction measures have been implemented and interior noise levels are in compliance with this table.
4. Determined for a typical worst-case hour during periods of use.

TABLE 10: STATIONARY SOURCE NOISE STANDARDS (TABLE N-3 OF LATHROP GENERAL PLAN)

Noise Level Descriptor	Daytime 7am to 10pm	Nighttime 10pm to 7am
Hourly L_{eq}, dB	55	45

1. Each of the noise levels specified above should be lowered by 5 dB for simple noise tones, noises consisting primarily of speech or music, or recurring impulsive noises. Such noises are generally considered to be particularly annoying and are a primary source of noise complaints.
2. No standards have been included for interior noise levels. Standard construction practices should, with the exterior noise levels identified, result in acceptable interior noise levels.
3. Stationary noise sources which are typically of concern include, but are not limited to, the following:
    a. HVAC Systems
    b. Pump Stations
    c. Emergency Generators
    d. Steam Valves
    e. Generators
    f. Air Compressors
    g. Conveyor Systems
    h. Pile Drivers
    i. Drill Rigs
    j. Welders
    k. Outdoor Speaker
    l. Cooling Towers/Evaporative Condensers
    m. Lift Stations
    n. Boilers
    o. Steam Turbines
    p. Fans
    q. Heavy Equipment
    r. Transformers
    s. Grinders
    t. Gas or Diesel Motors
    u. Cutting Equipment
    v. Blowers
4. The types of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities, pump stations, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.

City of Lathrop Noise Ordinance

The City of Lathrop Noise Ordinance sets limits for community noise exposure, similar to those outlined above in the General Plan Noise Element. The Noise Ordinance standards are contained in Section

8.20.040 of the Lathrop Municipal Code. Construction activities are exempt from these regulations, when conducted according to Section 8.20.110, as outlined below.

Where the ambient noise level is less than designated in this section, the respective noise level in this section shall govern:

TABLE 11: CITY OF LATHROP NOISE ORDINANCE

Zone	Time	Very Quiet (rural, suburban)	Slightly Quiet (suburban, urban)	Noisy (urban)
Residential, Low	10 p.m. to 7 a.m.	40	45	50
	7 p.m. to 10 p.m.	45	50	55
	7 a.m. to 7 p.m.	50	55	60
Residential, Multifamily	10 p.m. to 7 a.m.	45	50	55
	7 a.m. to 10 p.m.	50	55	60
Commercial	10 p.m. to 7 a.m.	50	55	60
	7 a.m. to 10 p.m.	55	60	65
Limited Industrial	anytime	70	70	70
General Industrial	anytime	75	75	75

(Ord. 21-418 § 2; prior code § 99.04)
Sound Level A, Decibels Community Environment Classification

8.20.110 Construction of buildings and projects:

It shall be unlawful for any person within a residential zone or within a radius of five hundred (500) feet therefrom, to operate equipment or perform any outside construction or repair work on buildings, structures or projects or to operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or any other construction type device between the hours of ten p.m. of one day and seven a.m. of the next day, or eleven p.m. and nine a.m. Fridays, Saturdays and legal holidays, in such a manner that a reasonable person of normal sensitiveness residing in the area is caused discomfort or annoyance unless beforehand a permit therefore has been duly obtained from the office or body of the city having the function to issue permits of this kind. No permit shall be required to perform emergency work as defined in Sections 8.20.010 through 8.20.040. (Prior code § 99.40)

Criteria for Acceptable Vibration

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception of the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities (p.p.v.) in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. **Table 12**, which was developed by Caltrans, shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

Table 12 indicates that the threshold for architectural damage to structures is 0.20 in/sec p.p.v. A threshold of 0.2 in/sec p.p.v. is considered to be a reasonable threshold for short-term construction projects.

TABLE 12: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS

Peak Particle Velocity		Human Reaction	Effect on Buildings
mm/second	in/second		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of “architectural” damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of “architectural” damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize “architectural” damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possibly minor structural damage

Source: *Transportation Related Earthborne Vibrations.* Caltrans. TAV-02-01-R9601. February 20, 2002.

IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in significant noise impacts if noise levels conflict with adopted environmental standards or plans, or if noise generated by the project would substantially increase existing noise levels at sensitive receivers on a permanent or temporary basis. Significance criteria for noise impacts are drawn from CEQA Guidelines Appendix G (Items XI [a-f]).

Would the project:

a. Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b. Generate excessive groundborne vibration or groundborne noise levels?

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Noise Level Increase Criteria for Long-Term Project-Related Noise Level Increases

The City of Lathrop establishes criteria for determination of significant noise impacts due to stationary and non-transportation noise sources in Policy N-1.4A. The policy states that a significant impact will occur if the project results in an exceedance of the noise level standards contained in the General Plan or if the project will result in an increase in ambient noise levels by more than 3 dB.

The City of Lathrop establishes criteria for determination of significant noise impacts due to transportation noise sources in Policy N-1.4B. The policy states that where existing transportation noise levels are greater than 65 dBA L_{dn}, at the outdoor activity areas of noise-sensitive uses, a +1.5 dBA L_{dn} increase in roadway noise levels will be considered significant. Where transportation noise levels are between 60 dBA L_{dn} and 65 dBA L_{dn}, a +3.0 dB L_{dn} increase in roadway noise levels will be considered significant. Where transportation noise levels are less than 60 dBA L_{dn}, a +5.0 dB L_{dn} increase in roadway noise levels will be considered significant.

Temporary Construction Noise Impacts

With temporary noise impacts (construction), identification of "substantial increases" depends upon the duration of the impact, the temporal daily nature of the impact, and the absolute change in decibel levels. The City has not adopted any formal standard for evaluating temporary construction noise which occurs within allowable hours. For short-term noise associated with Project construction, Saxelby Acoustics recommends use of the Caltrans increase criteria of 12 dBA (Caltrans Traffic Noise Protocol, 2020), applied to existing residential receptors in the project vicinity. This level of increase is approximately equivalent to a doubling of sound energy and has been the standard of significance for Caltrans projects at the state level for many years. Application of this standard to construction activities is considered reasonable considering the temporary nature of construction activities.

PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

Impact 1: ***Would the project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?***

Traffic Noise Increases at Off-Site Receptors

Based upon the City of Lathrop General Plan, where existing traffic noise levels are greater than 65 dBA L_{dn}, at the outdoor activity areas of noise-sensitive uses, a +1.5 dBA L_{dn} increase in roadway noise levels will be considered significant. Where traffic noise levels are between 60 dBA L_{dn} and 65 dBA L_{dn}, a +3.0 dB L_{dn} increase in roadway noise levels will be considered significant. Where traffic noise levels are less than 60 dBA L_{dn}, a +5.0 dB L_{dn} increase in roadway noise levels will be considered significant. **Tables 13-15** provide an assessment of significance for each roadway segment in the project vicinity.

TABLE 13: EXISTING PLUS PROJECT TRAFFIC NOISE INCREASE SIGNIFICANCE ANALYSIS

Roadway	Segment	Existing No Project (L_{dn} dBA)	Significance Criterion	Existing + Project (L_{dn} dBA)	Change	Significant Impact?
Golden Valley Pkwy	South of Spartan Way	62.7	+3.0 dB	62.8	0.1	No
Lathrop Rd	North of Barbara Terry Rd	49.7	>60 or +5.0 dB	52.6	2.9	No
Louise Ave.	East of I-5	66.4	+1.5 dB	66.5	0.1	No
McKee Blvd	West of Barbara Terry Blvd	51.6	>60 or +5.0 dB	51.9	0.3	No
River Islands Pkwy	West of Golden Valley Pkwy	62.6	+3.0 dB	63.7	1.1	No
River Islands Pkwy	West of McKee Blvd	57.5	>60 or +5.0 dB	59.1	1.6	No
River Islands Pkwy	West of Project Street C	55.2	>60 or +5.0 dB	55.6	0.4	No
Spartan Way	West of Golden Valley Pkwy	58.6	>60 or +5.0 dB	58.8	0.2	No

Notes: All noise levels include contributions from the roadway segment listed as well as I-5.

TABLE 14: BASELINE PLUS PROJECT TRAFFIC NOISE INCREASE SIGNIFICANCE ANALYSIS

Roadway	Segment	Baseline No Project (L_{dn} dBA)	Significance Criterion	Baseline + Project (L_{dn} dBA)	Change	Significant Impact?
Golden Valley Pkwy	South of Spartan Way	63.3	+3.0 dB	63.4	0.1	No
Lathrop Rd	North of Barbara Terry Rd	49.9	>60 or +5.0 dB	52.7	2.8	No
Louise Ave.	East of I-5	67.4	+1.5 dB	67.6	0.2	No
McKee Blvd	West of Barbara Terry Blvd	51.6	>60 or +5.0 dB	51.9	0.3	No
River Islands Pkwy	West of Golden Valley Pkwy	65.2	+1.5 dB	65.8	0.6	No
River Islands Pkwy	West of McKee Blvd	60.9	+3.0 dB	61.7	0.8	No
River Islands Pkwy	West of Project Street C	58.3	>60 or +5.0 dB	58.4	0.1	No
Spartan Way	West of Golden Valley Pkwy	59.7	>60 or +5.0 dB	59.9	0.2	No

Notes: All noise levels include contributions from the roadway segment listed as well as I-5.

TABLE 15: CUMULATIVE PLUS PROJECT TRAFFIC NOISE INCREASE SIGNIFICANCE ANALYSIS

Roadway	Segment	Cumulative No Project (L_{dn} dBA)	Significance Criterion	Cumulative + Project (L_{dn} dBA)	Change	Significant Impact?
Golden Valley Pkwy	South of Spartan Way	64.3	+3.0 dB	64.4	0.1	No
Lathrop Rd	North of Barbara Terry Rd	50.9	>60 or +5.0 dB	53.3	2.4	No
Louise Ave.	East of I-5	68.5	+1.5 dB	68.6	0.1	No
McKee Blvd	West of Barbara Terry Blvd	52.6	>60 or +5.0 dB	52.8	0.2	No
River Islands Pkwy	West of Golden Valley Pkwy	66.4	+1.5 dB	66.9	0.5	No
River Islands Pkwy	West of McKee Blvd	62.0	+3.0 dB	62.7	0.7	No
River Islands Pkwy	West of Project Street C	59.4	>60 or +5.0 dB	59.6	0.2	No
Spartan Way	West of Golden Valley Pkwy	60.8	+3.0 dB	60.9	0.1	No

Notes: All noise levels include contributions from the roadway segment listed as well as I-5.

As shown in **Tables 13-15**, increases in traffic on the local roadway network are not predicted to cause significant increases in noise levels. Therefore, traffic noise impacts would be ***less-than-significant***.

Operational Noise Increases

The proposed project would include typical residential noise which would be compatible with the existing adjacent residential uses.

Construction Noise

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. As indicated in **Table 6,** activities involved in construction would generate maximum noise levels ranging from 76 to 90 dBA L_{max} at a distance of 50 feet. Construction activities would also be temporary in nature and are anticipated to occur during normal daytime working hours.

The City of Lathrop Municipal Code establishes acceptable hours of construction as between 7:00 a.m. and 10:00 p.m. Sunday through Thursday and between 9:00 a.m. and 11:00 p.m. on Friday, Saturday, and legal holidays.

Caltrans defines a significant increase due to noise as an increase of 12 dBA over existing ambient noise levels; Saxelby Acoustics used this criterion to evaluate increases due to construction noise associated with the project. As shown in **Table 6**, construction equipment is predicted to generate noise levels of up to 90 dBA L_{max} at 50 feet. Construction noise is evaluated as occurring at the center of the site to represent average noise levels generated over the duration of construction across the project site. **Table 16** provides the predicted noise levels at the nearest sensitive receptor to each project area.

TABLE 16: CONSTRUCTION NOISE LEVELS AT SENSITIVE RECEPTORS

Phase	Distance to Sensitive receptors[1]	Representative Noise Receptor	Existing Max[2]	Construction Max	Increase Over Ambient	Exceeds 12 dB?
1	80	LT-1	80[3]	86	6	No
2	680	LT-1	80[3]	67	0	No
3	525	LT-2	66	65[4]	0	No
4	1160	LT-2	66	63	0	No
5	1940	LT-2	66	58	0	No
6	1220	LT-2	66	62	0	No

Notes:
[1]As measured from the center of construction area.
[2]Based upon lowest average daytime maximum noise level measured.
[3]A -5 dB correction was applied to account for existing sound wall shielding existing sensitive receptors.
[4]A -5 dB correction was applied to account for existing sound wall shielding proposed residences from Phase 3 construction area.

As shown in the table, the maximum increase over ambient due to construction noise is 6 dB. Therefore, the project construction will not cause an increase of greater than 12 dB at the nearby sensitive receptors.

Noise would also be generated during the construction phase by increased truck traffic on area roadways. A project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from the construction site. This noise increase would be of short duration and would occur during daytime hours.

Although construction activities are temporary in nature and would occur during normal daytime working hours, construction-related noise could result in sleep interference at existing noise-sensitive land uses in the vicinity of the construction if construction activities were to occur outside the normal daytime hours. Therefore, impacts resulting from noise levels temporarily exceeding the threshold of significance due to construction would be considered ***potentially significant***. Mitigation measure 1(a) would reduce construction noise impacts to ***less-than-significant***.

Transportation Noise on Project Site (Non-CEQA Issue)

Exterior Transportation Noise

Compliance with City standards on new noise-sensitive receptors is not a CEQA consideration. However, this information is provided here so that a determination can be made regarding the ability of the proposed project to meet the requirements of the City of Lathrop for exterior and interior noise levels at new sensitive uses proposed under the project.

Internal Project Roadways

As previously discussed, the proposed internal roadway Street W is predicted to generate noise levels of up to 55 dBA CNEL at the outdoor activity areas of the sensitive receptors. It should be noted that this noise level does not include a sound wall. This level would comply with the City's 60 dBA CNEL exterior noise level standard. The noise levels at the sensitive receptors including the proposed 6-foot-tall sound walls would be 48 dBA CNEL. **Appendix D** contains the inputs and results for this calculation.

Off-Site Transportation Noise Sources

As shown on **Figure 4**, the proposed project outdoor activity areas would be exposed to exterior noise levels up to 59 dBA meeting the City's 60 dBA CNEL exterior noise standard for residential uses along River Islands Parkway. This assumes outdoor areas are shielded from River Islands Parkway by 8-foot-tall barriers as proposed in the project plans.

Interior Noise

Modern building construction methods typically yield an exterior-to-interior noise level reduction of 25 dBA[1]. Therefore, where exterior noise levels are 70 dBA L_{dn}, or less, no additional interior noise control measures are typically required. For this project, exterior noise levels are predicted to be up to 67 dBA L_{dn} at the second story of the buildings closest to River Islands Parkway. This would result in interior noise levels of up to 42 dBA L_{dn} at the second story receivers based on typical building construction. This complies with the City of Lathrop General Plan which requires that interior noise levels do not exceed 45 dB L_{dn}. Therefore, no additional noise control measures are required to reduce interior noise to acceptable levels.

It should be noted that interior noise control measures are based upon an estimate of the future residence layouts. These assumptions should be verified once floor plans become available for an accurate assessment of interior noise control measures.

[1] Assumes a minimum STC of 29 for exterior window assemblies.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a ***less-than-significant*** level.

1(a) The City shall establish the following as conditions of approval for any permit that results in the use of construction equipment:

- Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the hours of 7:00 a.m. and 10:00 p.m. Sunday through Thursday and between 9:00 a.m. and 11:00 p.m. on Friday, Saturday, and legal holidays.
- Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.
- When not in use, motorized construction equipment shall not be left idling for more than 5 minutes.
- Stationary equipment (power generators, compressors, etc.) shall be located at the furthest practical distance from nearby noise-sensitive land uses or sufficiently shielded to reduce noise-related impacts.

Timing/Implementation: Implemented prior to approval of grading and/or building permits
Enforcement/Monitoring: City of Lathrop Community Development Services Department

Impact 2: Would the project generate excessive groundborne vibration or groundborne noise levels?

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural.

The **Table 7** data indicate that construction vibration levels anticipated for the project are less than the 0.2 in/sec threshold at distances of 26 feet. Sensitive receptors which could be impacted by construction related vibrations, especially vibratory compactors/rollers, are located approximately 26 feet, or further, from typical construction activities. At these distances construction vibrations are not predicted to exceed acceptable levels. Additionally, construction activities would be temporary in nature and would likely occur during normal daytime working hours.

This is a **less-than-significant** impact and no mitigation is required.

Impact 3: ***For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?***

There are no airports within two miles of the project site. Therefore, this impact is not applicable to the proposed project.

REFERENCES

American National Standards Institute. (1998). *[Standard] ANSI S1.43-1997 (R2007): Specifications for integrating-averaging sound level meters*. New York: Acoustical Society of America.

American Standard Testing Methods, *Standard Guide for Measurement of Outdoor A-Weighted Sound Levels, American Standard Testing Methods (ASTM) E1014-08*, 2008.

ASTM E1014-12. *Standard Guide for Measurement of Outdoor A-Weighted Sound Levels*. ASTM International. West Conshohocken, PA. 2012.

ASTM E1780-12. *Standard Guide for Measuring Outdoor Sound Received from a Nearby Fixed Source.* ASTM International. West Conshohocken, PA. 2012.

Barry, T M. (1978). *FHWA highway traffic noise prediction model* (FHWA-RD-77-108). Washington, DC: U.S. Department of transportation, Federal highway administration, Office of research, Office of environmental policy.

California Department of Transportation (Caltrans), *Technical Noise Supplement, Traffic Noise Analysis Protocol*, September 2013.

Egan, M. D. (1988). Architectural acoustics. United States of America: McGraw-Hill Book Company.

Federal Highway Administration. *FHWA Roadway Construction Noise Model User's Guide.* FHWA-HEP-05-054 DOT-VNTSC-FHWA-05-01. January 2006.

Hanson, Carl E. (Carl Elmer). (2006). *Transit noise and vibration impact assessment*. Washington, DC: U.S. Department of Transportation, Federal Transit Administration, Office of Planning and Environment.

International Electrotechnical Commission. Technical committee 29: Electroacoustics. International Organization of Legal Metrology. (2013). *Electroacoustics: Sound level meters*.

International Organization for Standardization. (1996). *Acoustic - ISO 9613-2: Attenuation of sound during propagation outdoors. Part 2: General methods of calculation*. Ginevra: I.S.O.

Miller, L. N., Bolt, Beranek, & and Newman, Inc. (1981). *Noise control for buildings and manufacturing plants*. Cambridge, MA: Bolt, Beranek and Newman, Inc.

SoundPLAN. SoundPLAN GmbH. Backnang, Germany. http://www.soundplan.eu/english/

Appendix A: Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
ASTC	Apparent Sound Transmission Class. Similar to STC but includes sound from flanking paths and correct for room reverberation. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by +5 dBA and nighttime hours weighted by +10 dBA.
DNL	See definition of Ldn.
IIC	Impact Insulation Class. An integer-number rating of how well a building floor attenuates impact sounds, such as footsteps. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one-hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
NIC	Noise Isolation Class. A rating of the noise reduction between two spaces. Similar to STC but includes sound from flanking paths and no correction for room reverberation.
NNIC	Normalized Noise Isolation Class. Similar to NIC but includes a correction for room reverberation.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
RT60	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is a rating, in decibels, of a discrete event, such as an aircraft flyover or train pass by, that compresses the total sound energy into a one-second event.
SPC	Speech Privacy Class. SPC is a method of rating speech privacy in buildings. It is designed to measure the degree of speech privacy provided by a closed room, indicating the degree to which conversations occurring within are kept private from listeners outside the room.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations. The STC rating is typically used to rate the sound transmission of a specific building element when tested in laboratory conditions where flanking paths around the assembly don't exist. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

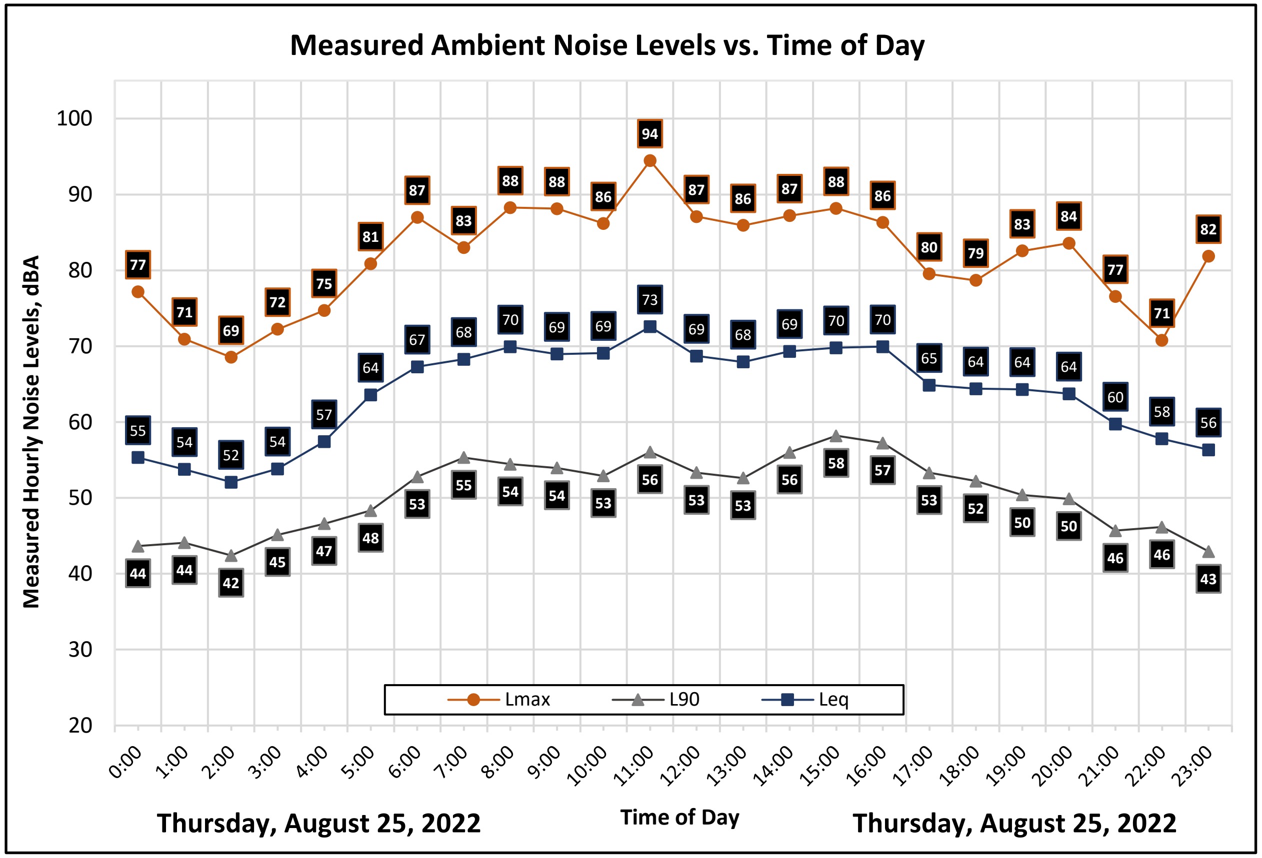
Appendix B: Continuous and Short-Term Ambient Noise Measurement Results

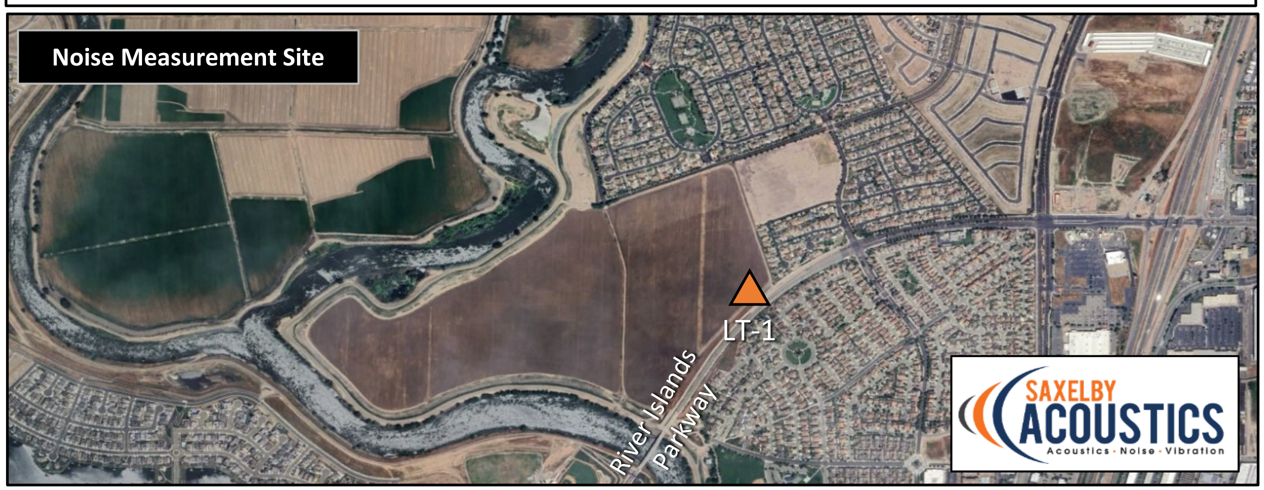
Appendix B1: Continuous Noise Monitoring Results

Site: LT-1
Project: Mossdale West TM Lathrop
Location: Southeastern Project Boundary
Coordinates: (37.80958572, -121.309757)
Meter: LDL 820-9
Calibrator: CAL200

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Thursday, August 25, 2022	0:00	55	77	47	44
Thursday, August 25, 2022	1:00	54	71	46	44
Thursday, August 25, 2022	2:00	52	69	45	42
Thursday, August 25, 2022	3:00	54	72	47	45
Thursday, August 25, 2022	4:00	57	75	50	47
Thursday, August 25, 2022	5:00	64	81	57	48
Thursday, August 25, 2022	6:00	67	87	63	53
Thursday, August 25, 2022	7:00	68	83	65	55
Thursday, August 25, 2022	8:00	70	88	65	54
Thursday, August 25, 2022	9:00	69	88	64	54
Thursday, August 25, 2022	10:00	69	86	63	53
Thursday, August 25, 2022	11:00	73	94	65	56
Thursday, August 25, 2022	12:00	69	87	64	53
Thursday, August 25, 2022	13:00	68	86	62	53
Thursday, August 25, 2022	14:00	69	87	64	56
Thursday, August 25, 2022	15:00	70	88	65	58
Thursday, August 25, 2022	16:00	70	86	65	57
Thursday, August 25, 2022	17:00	65	80	63	53
Thursday, August 25, 2022	18:00	64	79	63	52
Thursday, August 25, 2022	19:00	64	83	62	50
Thursday, August 25, 2022	20:00	64	84	61	50
Thursday, August 25, 2022	21:00	60	77	53	46
Thursday, August 25, 2022	22:00	58	71	50	46
Thursday, August 25, 2022	23:00	56	82	47	43

Statistics	Leq	Lmax	L50	L90
Day Average	68	85	63	53
Night Average	61	76	50	46
Day Low	60	77	53	46
Day High	73	94	65	58
Night Low	52	69	45	42
Night High	67	87	63	53
Ldn	69	Day %		92
CNEL	69	Night %		8



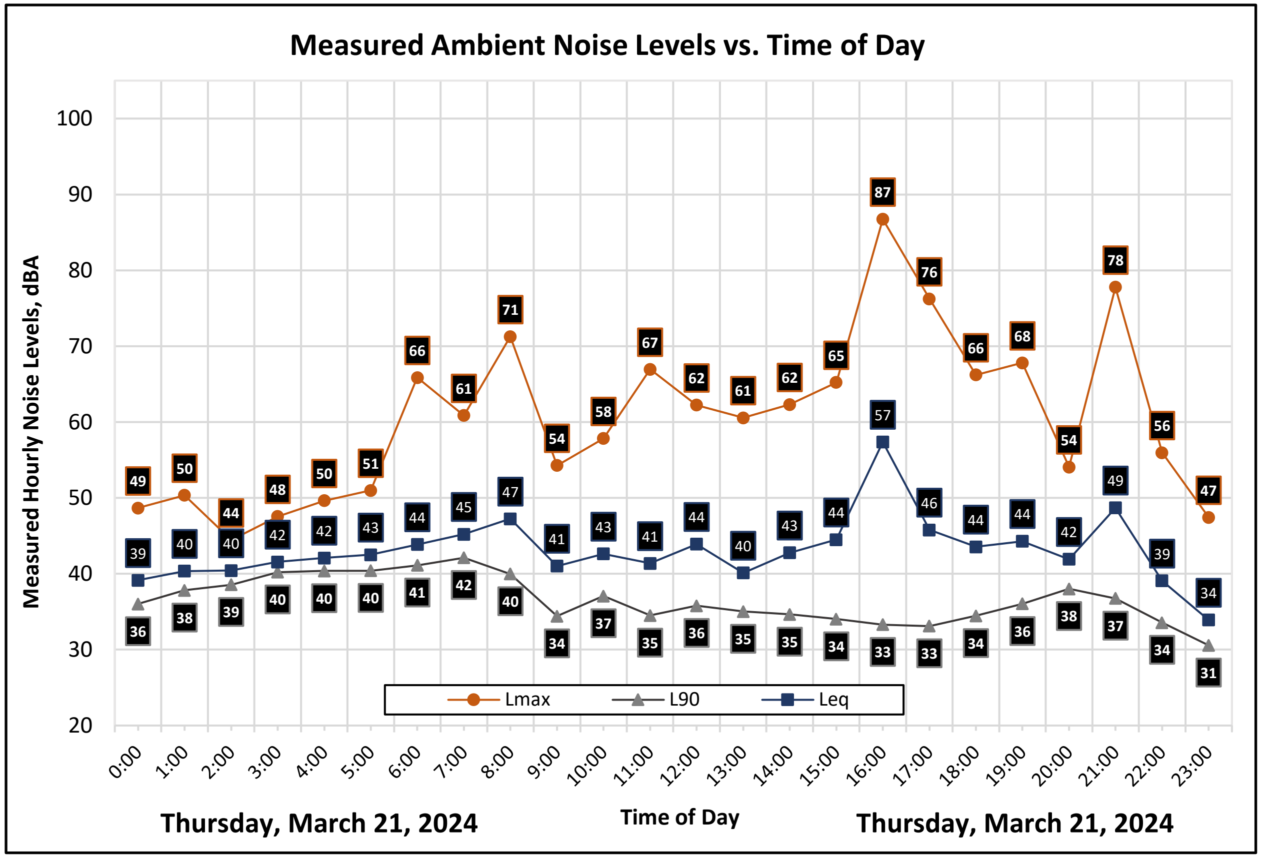


Appendix B2: Continuous Noise Monitoring Results

Site: LT-2
Project: Mossdale West TM Lathrop
Meter: LDL 820-1
Location: Northern Project Boundary
Calibrator: CAL200
Coordinates: (37.8122881, -121.3156978)

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Thursday, March 21, 2024	0:00	39	49	39	36
Thursday, March 21, 2024	1:00	40	50	40	38
Thursday, March 21, 2024	2:00	40	44	40	39
Thursday, March 21, 2024	3:00	42	48	41	40
Thursday, March 21, 2024	4:00	42	50	42	40
Thursday, March 21, 2024	5:00	43	51	42	40
Thursday, March 21, 2024	6:00	44	66	42	41
Thursday, March 21, 2024	7:00	45	61	44	42
Thursday, March 21, 2024	8:00	47	71	44	40
Thursday, March 21, 2024	9:00	41	54	38	34
Thursday, March 21, 2024	10:00	43	58	41	37
Thursday, March 21, 2024	11:00	41	67	36	35
Thursday, March 21, 2024	12:00	44	62	39	36
Thursday, March 21, 2024	13:00	40	61	37	35
Thursday, March 21, 2024	14:00	43	62	37	35
Thursday, March 21, 2024	15:00	44	65	37	34
Thursday, March 21, 2024	16:00	57	87	37	33
Thursday, March 21, 2024	17:00	46	76	36	33
Thursday, March 21, 2024	18:00	44	66	38	34
Thursday, March 21, 2024	19:00	44	68	39	36
Thursday, March 21, 2024	20:00	42	54	41	38
Thursday, March 21, 2024	21:00	49	78	39	37
Thursday, March 21, 2024	22:00	39	56	38	34
Thursday, March 21, 2024	23:00	34	47	33	31

Statistics	Leq	Lmax	L50	L90
Day Average	48	66	39	36
Night Average	41	51	40	38
Day Low	40	54	36	33
Day High	57	87	44	42
Night Low	34	44	33	31
Night High	44	66	42	41
Ldn	49	Day %		90
CNEL	50	Night %		10

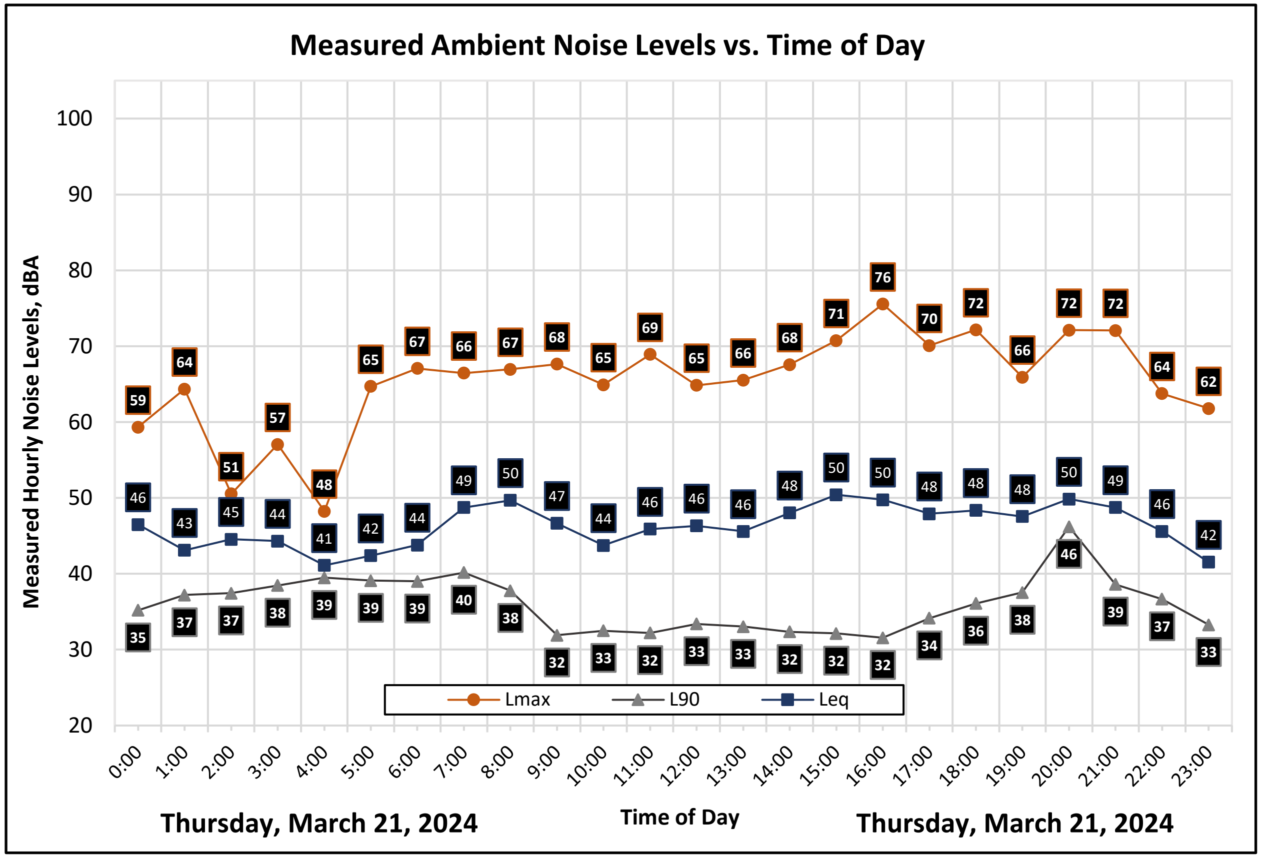


Appendix B3: Continuous Noise Monitoring Results

Site: LT-3
Project: Mossdale West TM Lathrop
Meter: LDL 820-3
Location: North of Project
Calibrator: CAL200
Coordinates: (37.8150770, -121.3159912)

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Thursday, March 21, 2024	0:00	46	59	41	35
Thursday, March 21, 2024	1:00	43	64	39	37
Thursday, March 21, 2024	2:00	45	51	44	37
Thursday, March 21, 2024	3:00	44	57	43	38
Thursday, March 21, 2024	4:00	41	48	41	39
Thursday, March 21, 2024	5:00	42	65	41	39
Thursday, March 21, 2024	6:00	44	67	40	39
Thursday, March 21, 2024	7:00	49	66	43	40
Thursday, March 21, 2024	8:00	50	67	42	38
Thursday, March 21, 2024	9:00	47	68	40	32
Thursday, March 21, 2024	10:00	44	65	36	33
Thursday, March 21, 2024	11:00	46	69	36	32
Thursday, March 21, 2024	12:00	46	65	37	33
Thursday, March 21, 2024	13:00	46	66	36	33
Thursday, March 21, 2024	14:00	48	68	35	32
Thursday, March 21, 2024	15:00	50	71	36	32
Thursday, March 21, 2024	16:00	50	76	35	32
Thursday, March 21, 2024	17:00	48	70	38	34
Thursday, March 21, 2024	18:00	48	72	39	36
Thursday, March 21, 2024	19:00	48	66	41	38
Thursday, March 21, 2024	20:00	50	72	49	46
Thursday, March 21, 2024	21:00	49	72	47	39
Thursday, March 21, 2024	22:00	46	64	45	37
Thursday, March 21, 2024	23:00	42	62	36	33

Statistics	Leq	Lmax	L50	L90
Day Average	48	69	39	35
Night Average	44	60	41	37
Day Low	44	65	35	32
Day High	50	76	49	46
Night Low	41	48	36	33
Night High	46	67	45	39
Ldn	51	Day %		84
CNEL	51	Night %		16



Appendix B2 : Short Term Noise Monitoring Results

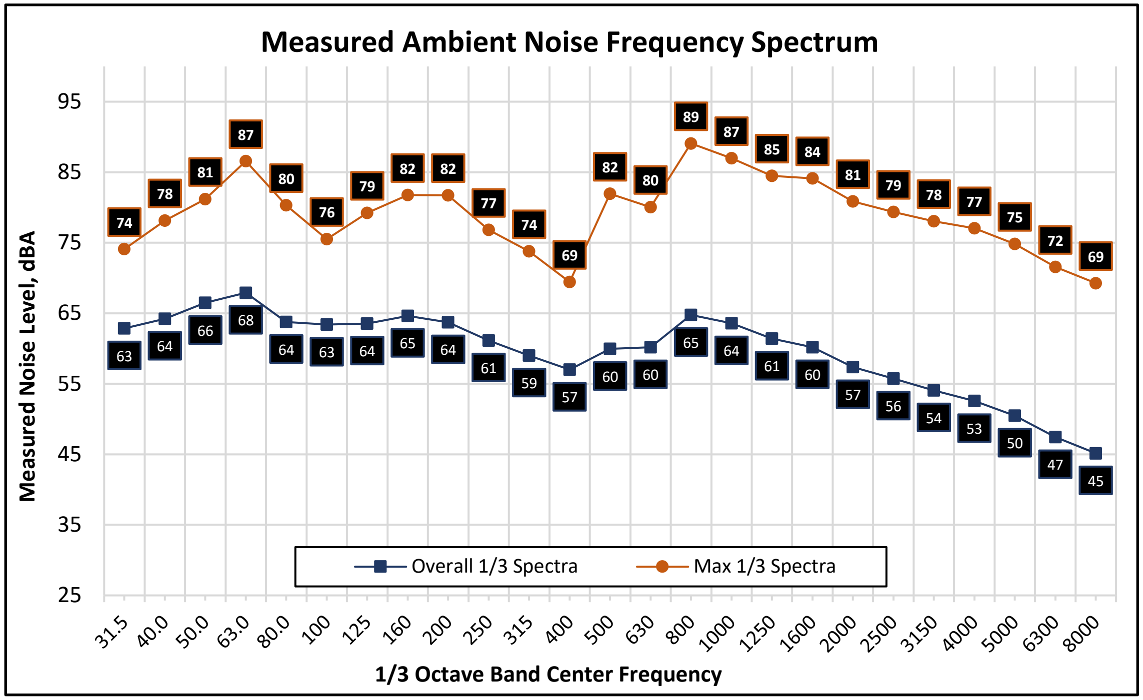
Site: ST-1
Project: Mossdale West TM Lathrop
Location: South East of Project Boundary
Coordinates: 37.80958572°, -121.30975795°
Meter: LDL 831-5
Calibrator: CAL200

Start: 2022-08-24 13:45:05
Stop: 2022-08-24 13:55:05
SLM: Model 831
Serial: 2658

Measurement Results, dBA	
Duration:	0:10
L_{eq}:	71
L_{max}:	94
L_{min}:	40
L_{50}:	65
L_{90}:	55

Notes

Primary noise source was traffic on the local roadway network



SAXELBY ACOUSTICS
Acoustics • Noise • Vibration

Appendix C: Traffic Noise Calculation Inputs and Results

Appendix C-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 220711 Mossdale West
Description: Existing Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Golden Valley Pkwy	South of Spartan Way	8,990	84	0	16	1.0%	1.0%	45	115	-5	141	65	30	56.3
2	Lathrop Rd	North of Barbara Terry Rd	350	84	0	16	1.0%	1.0%	25	65	0	7	3	2	45.6
3	Louise Ave.	East of I-5	22,290	84	0	16	1.0%	1.0%	45	65	-5	258	120	56	64.0
4	McKee Blvd	West of Barbara Terry Blvd	870	84	0	16	1.0%	1.0%	25	80	-5	13	6	3	43.2
5	River Islands Pkwy	West of Golden Valley Pkwy	16,300	84	0	16	1.0%	1.0%	45	75	-5	209	97	45	61.7
6	River Islands Pkwy	West of McKee Blvd	10,270	84	0	16	1.0%	1.0%	35	85	-5	102	47	22	56.2
7	River Islands Pkwy	West of Project Street C	10,270	84	0	16	1.0%	1.0%	35	130	-5	102	47	22	53.4
8	Spartan Way	West of Golden Valley Pkwy	7,620	84	0	16	1.0%	1.0%	35	85	-5	84	39	18	54.9
9	I-5	Golden Valley Pkwy	110,000	60	0	40	2.8%	23.1%	65	1500	-5	4151	1927	894	61.6
10	I-5	Lathrop Rd	110,000	60	0	40	2.8%	23.1%	65	6000	-10	4151	1927	894	47.6
11	I-5	Louise Ave.	110,000	60	0	40	2.8%	23.1%	65	1300	-5	4151	1927	894	62.6
12	I-5	McKee Blvd	110,000	60	0	40	2.8%	23.1%	65	3600	-10	4151	1927	894	50.9
13	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	1800	-10	4151	1927	894	55.4
14	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	3200	-10	4151	1927	894	51.7
15	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	3900	-10	4151	1927	894	50.4
16	I-5	Spartan Way	110,000	60	0	40	2.8%	23.1%	65	1600	-10	4151	1927	894	56.2

SAXELBY ACOUSTICS
Acoustics • Noise • Vibration

Appendix C-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 220711 Mossdale West
Description: Existing Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Golden Valley Pkwy	South of Spartan Way	9,420	84	0	16	1.0%	1.0%	45	115	-5	145	67	31	56.5
2	Lathrop Rd	North of Barbara Terry Rd	1,210	84	0	16	1.0%	1.0%	25	65	0	16	8	4	51.0
3	Louise Ave.	East of I-5	23,580	84	0	16	1.0%	1.0%	45	65	-5	268	124	58	64.2
4	McKee Blvd	West of Barbara Terry Blvd	1,300	84	0	16	1.0%	1.0%	25	80	-5	17	8	4	45.0
5	River Islands Pkwy	West of Golden Valley Pkwy	22,300	84	0	16	1.0%	1.0%	45	75	-5	258	120	56	63.0
6	River Islands Pkwy	West of McKee Blvd	16,270	84	0	16	1.0%	1.0%	35	85	-5	139	65	30	58.2
7	River Islands Pkwy	West of Project Street C	11,560	84	0	16	1.0%	1.0%	35	130	-5	111	51	24	54.0
8	Spartan Way	West of Golden Valley Pkwy	8,480	84	0	16	1.0%	1.0%	35	85	-5	90	42	19	55.4
9	I-5	Golden Valley Pkwy	110,000	60	0	40	2.8%	23.1%	65	1500	-5	4151	1927	894	61.6
10	I-5	Lathrop Rd	110,000	60	0	40	2.8%	23.1%	65	6000	-10	4151	1927	894	47.6
11	I-5	Louise Ave.	110,000	60	0	40	2.8%	23.1%	65	1300	-5	4151	1927	894	62.6
12	I-5	McKee Blvd	110,000	60	0	40	2.8%	23.1%	65	3600	-10	4151	1927	894	50.9
13	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	1800	-10	4151	1927	894	55.4
14	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	3200	-10	4151	1927	894	51.7
15	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	3900	-10	4151	1927	894	50.4
16	I-5	Spartan Way	110,000	60	0	40	2.8%	23.1%	65	1600	-10	4151	1927	894	56.2

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix C-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 220711 Mossdale West
Description: EPAP Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Golden Valley Pkwy	South of Spartan Way	14,790	84	0	16	1.0%	1.0%	45	115	-5	196	91	42	58.5
2	Lathrop Rd	North of Barbara Terry Rd	380	84	0	16	1.0%	1.0%	25	65	0	8	3	2	46.0
3	Louise Ave.	East of I-5	33,140	84	0	16	1.0%	1.0%	45	65	-5	336	156	72	65.7
4	McKee Blvd	West of Barbara Terry Blvd	940	84	0	16	1.0%	1.0%	25	80	-5	14	6	3	43.5
5	River Islands Pkwy	West of Golden Valley Pkwy	32,720	84	0	16	1.0%	1.0%	45	75	-5	333	155	72	64.7
6	River Islands Pkwy	West of McKee Blvd	26,270	84	0	16	1.0%	1.0%	35	85	-5	191	89	41	60.3
7	River Islands Pkwy	West of Project Street C	26,270	84	0	16	1.0%	1.0%	35	130	-5	191	89	41	57.5
8	Spartan Way	West of Golden Valley Pkwy	12,760	84	0	16	1.0%	1.0%	35	85	-5	118	55	25	57.2
9	I-5	Golden Valley Pkwy	110,000	60	0	40	2.8%	23.1%	65	1500	-5	4151	1927	894	61.6
10	I-5	Lathrop Rd	110,000	60	0	40	2.8%	23.1%	65	6000	-10	4151	1927	894	47.6
11	I-5	Louise Ave.	110,000	60	0	40	2.8%	23.1%	65	1300	-5	4151	1927	894	62.6
12	I-5	McKee Blvd	110,000	60	0	40	2.8%	23.1%	65	3600	-10	4151	1927	894	50.9
13	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	1800	-10	4151	1927	894	55.4
14	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	3200	-10	4151	1927	894	51.7
15	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	3900	-10	4151	1927	894	50.4
16	I-5	Spartan Way	110,000	60	0	40	2.8%	23.1%	65	1600	-10	4151	1927	894	56.2

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix C-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 220711 Mossdale West
Description: EPAP Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Golden Valley Pkwy	South of Spartan Way	15,220	84	0	16	1.0%	1.0%	45	115	-5	200	93	43	58.6
2	Lathrop Rd	North of Barbara Terry Rd	1,240	84	0	16	1.0%	1.0%	25	65	0	17	8	4	51.1
3	Louise Ave.	East of I-5	34,430	84	0	16	1.0%	1.0%	45	65	-5	345	160	74	65.9
4	McKee Blvd	West of Barbara Terry Blvd	1,370	84	0	16	1.0%	1.0%	25	80	-5	18	8	4	45.2
5	River Islands Pkwy	West of Golden Valley Pkwy	38,720	84	0	16	1.0%	1.0%	45	75	-5	373	173	80	65.4
6	River Islands Pkwy	West of McKee Blvd	32,270	84	0	16	1.0%	1.0%	35	85	-5	220	102	47	61.2
7	River Islands Pkwy	West of Project Street C	27,560	84	0	16	1.0%	1.0%	35	130	-5	198	92	43	57.7
8	Spartan Way	West of Golden Valley Pkwy	13,620	84	0	16	1.0%	1.0%	35	85	-5	124	57	27	57.4
9	I-5	Golden Valley Pkwy	110,000	60	0	40	2.8%	23.1%	65	1500	-5	4151	1927	894	61.6
10	I-5	Lathrop Rd	110,000	60	0	40	2.8%	23.1%	65	6000	-10	4151	1927	894	47.6
11	I-5	Louise Ave.	110,000	60	0	40	2.8%	23.1%	65	1300	-5	4151	1927	894	62.6
12	I-5	McKee Blvd	110,000	60	0	40	2.8%	23.1%	65	3600	-10	4151	1927	894	50.9
13	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	1800	-10	4151	1927	894	55.4
14	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	3200	-10	4151	1927	894	51.7
15	I-5	River Islands Pkwy	110,000	60	0	40	2.8%	23.1%	65	3900	-10	4151	1927	894	50.4
16	I-5	Spartan Way	110,000	60	0	40	2.8%	23.1%	65	1600	-10	4151	1927	894	56.2

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix C-5

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 220711 Mossdale West
Description: Cumulative Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Golden Valley Pkwy	South of Spartan Way	19,520	84	0	16	1.0%	1.0%	45	115	-5	236	110	51	59.7
2	Lathrop Rd	North of Barbara Terry Rd	500	84	0	16	1.0%	1.0%	25	65	0	9	4	2	47.2
3	Louise Ave.	East of I-5	43,720	84	0	16	1.0%	1.0%	45	65	-5	404	188	87	66.9
4	McKee Blvd	West of Barbara Terry Blvd	1,240	84	0	16	1.0%	1.0%	25	80	-5	17	8	4	44.7
5	River Islands Pkwy	West of Golden Valley Pkwy	43,170	84	0	16	1.0%	1.0%	45	75	-5	401	186	86	65.9
6	River Islands Pkwy	West of McKee Blvd	34,660	84	0	16	1.0%	1.0%	35	85	-5	230	107	50	61.5
7	River Islands Pkwy	West of Project Street C	34,660	84	0	16	1.0%	1.0%	35	130	-5	230	107	50	58.7
8	Spartan Way	West of Golden Valley Pkwy	16,840	84	0	16	1.0%	1.0%	35	85	-5	142	66	31	58.4
9	I-5	Golden Valley Pkwy	134,221	60	0	40	2.8%	23.1%	65	1500	-5	4739	2200	1021	62.5
10	I-5	Lathrop Rd	134,221	60	0	40	2.8%	23.1%	65	6000	-10	4739	2200	1021	48.5
11	I-5	Louise Ave.	134,221	60	0	40	2.8%	23.1%	65	1300	-5	4739	2200	1021	63.4
12	I-5	McKee Blvd	134,221	60	0	40	2.8%	23.1%	65	3600	-10	4739	2200	1021	51.8
13	I-5	River Islands Pkwy	134,221	60	0	40	2.8%	23.1%	65	1800	-10	4739	2200	1021	56.3
14	I-5	River Islands Pkwy	134,221	60	0	40	2.8%	23.1%	65	3200	-10	4739	2200	1021	52.6
15	I-5	River Islands Pkwy	134,221	60	0	40	2.8%	23.1%	65	3900	-10	4739	2200	1021	51.3
16	I-5	Spartan Way	134,221	60	0	40	2.8%	23.1%	65	1600	-10	4739	2200	1021	57.1

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix C-6
FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Project #: 220711 Mossdale West
Description: Cumulative Plus Project Traffic
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway	Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Golden Valley Pkwy	South of Spartan Way	19,950	84	0	16	1.0%	1.0%	45	115	-5	240	111	52	59.8
2	Lathrop Rd	North of Barbara Terry Rd	1,360	84	0	16	1.0%	1.0%	25	65	0	18	8	4	51.5
3	Louise Ave.	East of I-5	45,010	84	0	16	1.0%	1.0%	45	65	-5	412	191	89	67.0
4	McKee Blvd	West of Barbara Terry Blvd	1,670	84	0	16	1.0%	1.0%	25	80	-5	20	9	4	46.0
5	River Islands Pkwy	West of Golden Valley Pkwy	49,170	84	0	16	1.0%	1.0%	45	75	-5	437	203	94	66.5
6	River Islands Pkwy	West of McKee Blvd	40,660	84	0	16	1.0%	1.0%	35	85	-5	256	119	55	62.2
7	River Islands Pkwy	West of Project Street C	35,950	84	0	16	1.0%	1.0%	35	130	-5	236	110	51	58.9
8	Spartan Way	West of Golden Valley Pkwy	17,700	84	0	16	1.0%	1.0%	35	85	-5	147	68	32	58.6
9	I-5	Golden Valley Pkwy	134,221	60	0	40	2.8%	23.1%	65	1500	-5	4739	2200	1021	62.5
10	I-5	Lathrop Rd	134,221	60	0	40	2.8%	23.1%	65	6000	-10	4739	2200	1021	48.5
11	I-5	Louise Ave.	134,221	60	0	40	2.8%	23.1%	65	1300	-5	4739	2200	1021	63.4
12	I-5	McKee Blvd	134,221	60	0	40	2.8%	23.1%	65	3600	-10	4739	2200	1021	51.8
13	I-5	River Islands Pkwy	134,221	60	0	40	2.8%	23.1%	65	1800	-10	4739	2200	1021	56.3
14	I-5	River Islands Pkwy	134,221	60	0	40	2.8%	23.1%	65	3200	-10	4739	2200	1021	52.6
15	I-5	River Islands Pkwy	134,221	60	0	40	2.8%	23.1%	65	3900	-10	4739	2200	1021	51.3
16	I-5	Spartan Way	134,221	60	0	40	2.8%	23.1%	65	1600	-10	4739	2200	1021	57.1

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix D: Internal Roadway Noise Level Calculations

Appendix D1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Noise Barrier Calculation: Data Input Sheet

Project #: 220711
Description: Mossdale West
Ldn/CNEL: Ldn
Hard/Soft: Soft

												Distance to Noise Contours		
Segment	Roadway Name	Segment Description	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Level, dBA	70 dB	65 dB	60 dB
1	Street W	South of Barbara Terry Dr	1,120	85	15	1	1	35	50	0	55	5	11	23

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

Appendix D2
FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:
Job Number: 220711
Description Mossdale West
Roadway Name: Street W
Location(s): 1

Noise Level Data:
Year: 2045
Auto L_{dn}, dB: 53
Medium Truck L_{dn}, dB: 43
Heavy Truck L_{dn}, dB: 48

Site Geometry:
Receiver Description: South of Barbara Terry Dr
Centerline to Barrier Distance (C_1): 40
Barrier to Receiver Distance (C_2): 10
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 0
Receiver Elevation[1]: 5
Base of Barrier Elevation: 0
Starting Barrier Height 0

Barrier Effectiveness:

		------------------- L_{dn}, dB -------------------				Barrier Breaks Line of Sight to...		
Top of Barrier Elevation (ft)	Barrier Height[2] (ft)	Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
0	0	53	43	48	55	No	No	No
1	1	53	43	48	55	No	No	No
2	2	52	42	48	54	No	No	No
3	3	49	40	48	52	No	No	No
4	4	48	38	46	51	No	No	No
5	5	48	38	44	50	Yes	Yes	No
6	6	46	37	43	48	Yes	Yes	Yes
7	7	45	35	42	47	Yes	Yes	Yes
8	8	43	34	41	45	Yes	Yes	Yes

Notes: [1] Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s).

APPENDIX E

Traffic Impact Analysis Report

Traffic Impact Analysis Report

Mossdale West

Lathrop, California

November 17, 2023

(Updated June 17, 2024)

TJKM

Contents

Tables

Figures

Appendices

EXECUTIVE SUMMARY

This report summarizes the results of the Traffic Impact Analysis (TIA) conducted for the proposed Mossdale West development in the City of Lathrop (City), California. The site is located south and east of the San Joaquin River, north of River Island Parkway, south of Barbary Terry Boulevard, and west of McKee Boulevard.

The project, which is comprised of vacant land, is expected to ultimately consist of approximately 829 to 912 single-family residential dwelling (SFDU) units. This study assumed the highest intensity development program of 912 units to be conservative in assessing potential impacts to the roadway network.

The purpose of this TIA is to evaluate the impacts on the transportation infrastructure due to the addition of traffic from the proposed project. The report includes evaluations and recommendations concerning project site access and on-site circulation for vehicles, bicycles, and pedestrians, and vehicle miles traveled (VMT).

To evaluate the impacts on the transportation infrastructure due to the addition of traffic from the proposed project, 14 study intersections (12 existing, two proposed) were evaluated during the weekday morning (a.m.) peak hour and weekday afternoon (p.m.) peak hour under three study scenarios. The study intersections were evaluated under:

- 2022 Existing Conditions, without and with the Mossdale West development;
- 2026 Baseline Conditions, without and with the Mossdale West development; and
- 2040 Cumulative Conditions, without and with the Mossdale West development.

For the purpose of this analysis, potential traffic operational effects from the proposed project are identified based on established operational thresholds for the City of Lathrop and guidance published by the California Office of Planning and Research (OPR).

Project Trip Generation

Using the methodology presented in the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 11th edition, (TGM) publication, the proposed development is expected to generate approximately 8,600 external vehicular trips during a typical weekday, of which 638 (166 inbound; 472 outbound) external vehicular trips are expected to occur during the a.m. peak hour and 857 (540 inbound; 317 outbound) external vehicular trips are expected to occur during the p.m. peak hour.

VMT Impacts

The project's anticipated 16.29 daily VMT per capita is higher than the Citywide VMT threshold of 15.44 daily VMT per capita. Therefore, VMT impacts for the Mossdale West project are ***significant*** and mitigation would be required. For the project to have "less-than-significant" impacts, the project's daily VMT per capita would need to be reduced by 6.08 percent (or 1.00 VMT per capita). Potential mitigations are listed below:

- Improve the pedestrian network – 5.7 percent reduction in total project VMT ***(recommended)***.
- Implement traffic calming measures and low stress bicycle facilities – 1.7 percent reduction in total project VMT ***(recommended)***.

- Increase transit service frequency – 6.3 percent reduction in total project VMT.
- Implement neighborhood or community-wide car-sharing program – 1.6 percent reduction in total Project VMT.
- Coordinate SchoolPools – 15 percent reduction in total project VMT.

Existing Conditions – Intersection Level of Service

Under this scenario, all of the study intersections operate within jurisdictional standards (Level of Service (LOS) D or better) during the a.m. and p.m. peak hours.

Existing Conditions plus Project – Intersection Level of Service

Under this scenario, 13 of the 14 study intersections are expected to continue to operate within jurisdictional standards (LOS D or better) during the a.m. and p.m. peak hours.

The following intersection would degrade from acceptable to unacceptable level of service with the addition of project traffic:

- River Islands Parkway and Street C (Intersection 10) operates at LOS F under one-way stop control.
    - It is recommended that the intersection be signalized and that a southbound right turn lane and an eastbound left turn lane be added. It is anticipated that a signal would be warranted per Warrant 3 ("Peak Hour") within the <u>California Manual on Uniform Traffic Control Devices</u> (CA MUTCD) based on the given volume. With these improvements, the intersection is projected to operate overall at LOS B during both peak hours.

With the proposed improvements in place, the proposed development would have a negligible impact on the surrounding road network under Existing Conditions.

Baseline Conditions – Intersection Level of Service

Under this scenario, six of the 12 existing study intersections are expected to continue to operate at acceptable service levels (LOS D or better) during the a.m. and p.m. peak hours.

The following intersections are projected to operate at unacceptable levels of service:

- Golden Valley Parkway and Spartan Way (Intersection 1) operates at LOS F during the p.m. peak hour.
- Golden Valley Parkway and River Islands Parkway (Intersection 3) operates at LOS F during both peak hours.
- Spartan Way/Lathrop Road and the I-5 ramps (Intersections 11 & 12) operate at LOS F during both peak hours.
- River Island Parkway/Louise Avenue and the I-5 ramps (Intersections 13 & 14) operate at LOS F during both peak hours.

Baseline Conditions plus Project – Intersection Level of Service

Under this scenario, six of the 14 study intersections are expected to continue to operate at an acceptable service levels (LOS D or better) during the a.m. and p.m. peak hours (similar to without project conditions).

The following seven intersections would require mitigations in order to account for additional demand due to the proposed development:

- Golden Valley Parkway and Spartan Way (Intersection 1) would operate at LOS E during the a.m. peak hour and would operate at LOS F with an increase in delay by 14.9 seconds per vehicle during the p.m. peak hour.
  - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection is anticipated to operate with less delay during both peak hours as compared to Baseline Conditions.
- Golden Valley Parkway and River Islands (Intersection 3) continues to operate at LOS F during both peak hours and would experience increases in delay of 22.7 seconds per vehicle and 23.0 seconds per vehicle during the a.m. and p.m. peak hours, respectively.
  - It is recommended that the signal timings of the intersection be changed slightly[1] and that the northbound right and southbound right turning movements operate with an overlap phase. With these changes, the intersection would operate with less delay during both peak hours as compared to Baseline Conditions.
- River Islands Parkway and McKee Boulevard (Intersection 5) degrades from LOS D to LOS E during both peak hours.
  - It is recommended that the signal timings of the intersection be changed slightly[1] and that the northbound right turning movement operate with an overlap phase to better accommodate the nearly 300 right turns per hour. With these changes, the intersection would operate similarly to Baseline Conditions in terms of vehicular delay.
- River Islands Parkway and Street C (Intersection 10) operates at LOS F under one-way stop control during both peak hours.
  - It is recommended that the intersection be signalized and with the addition of a southbound right turn lane and an eastbound left turn lane. With these improvements, the intersection is projected to operate overall at LOS B during both peak hours.

---

[1] Signal timings adjustments are referred to throughout this document as a form of mitigation and pertain to the reallocation of green time from one signal phase to another signal phase (e.x., two seconds of green time reallocated from the northbound left movement to the southbound through movement). Signal timings adjustments do not include changes in intersection offsets (if applicable) nor changes in the cycle length.

- Spartan Way / Lathrop Road at I-5 NB Ramps (Intersection 11) continues to operate at LOS F during both peak hours and would experience an increase in delay of 7.6 seconds per vehicle and 5.5 seconds per vehicle during the a.m. peak hour and p.m. peak hour, respectively.
  - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate with slightly less vehicular delay than under Baseline Conditions.
- Spartan Way / Lathrop Road at I-5 SB Ramps (Intersection 12) degrades from LOS E to LOS F during the a.m. peak hour and continues to operate at LOS F during the p.m. peak hour. The intersection would experience an increase in delay of 12.2 seconds per vehicle during the a.m. peak hour and 19.1 seconds per vehicle during the p.m. peak hour.
  - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate with slightly less vehicular delay than under Baseline Conditions during the a.m. peak hour and would operate similarly to Baseline Conditions during the p.m. peak hour.
- River Islands Parkway / Louise Avenue at I-5 SB Ramps (Intersection 14) continues to operate at LOS F during the both peak hours and would experience an increase in delay of 82.4 seconds per vehicle during the a.m. peak hour and 92.1 seconds per vehicle during the p.m. peak hour.
  - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate with less delay during the a.m. and p.m. peak hours as compared to Baseline Conditions. It should be noted, however, that the intersection would continue to operate with hundreds of seconds of delay.
  - In order to improve operates, physical modifications to the interchange ramp would be necessary. The City is currently assessing potential improvements to the interchange ramps. It is expected that with geometric improvements, delays at the intersection would substantially decrease.

The following intersection would experience **significant and unavoidable inconsistencies** with City standards due to additional traffic generated by the proposed development:

- River Island Parkway / Louise Avenue at I-5 NB Ramps (Intersection 13) continues to operate at LOS F during both peak hours. With the additional site generated traffic, the intersection experiences increases in delay of 40.1 seconds per vehicle during the a.m. peak hour and 59.6 seconds per vehicle during the p.m. peak hour.
  - To improve conditions, physical modifications to the interchange ramp would be necessary. The City is currently assessing potential improvements to the interchange ramps. It is expected that with geometric improvements, delays at the intersection would substantially decrease.

  - Of note, the City's General Plan (2022) states an exception to the LOS D standard "where constructing facilities with sufficient capacity would be unreasonably expensive." TJKM suggests that the project contribute a portion of funding towards improvements to the interchange relative to its fair share.

Cumulative Conditions – Intersection Level of Service

Under this scenario, five of the 12 study intersections are expected to continue to operate at an acceptable service levels (LOS D or better) during the a.m. and p.m. peak hours.

The following intersections are projected to operate at unacceptable level of service:

- Golden Valley Parkway and Spartan Way (Intersection 1) operates at LOS E during the a.m. peak hour and LOS F during the p.m. peak hour.
- Golden Valley Parkway and River Islands Parkway (Intersection 3) operates at LOS F during both peak hours.
- Golden Valley Parkway and McKee Boulevard (Intersection 5) operates at LOS E during the p.m. peak hour.
- Spartan Way / Lathrop Road and the I-5 ramps (Intersections 11 & 12) operate at LOS F during both peak hours.
- River Island Parkway / Louise Avenue and the I-5 ramps (Intersections 13 & 14) operate at LOS F during both peak hours.

Cumulative Conditions plus Project – Intersection Level of Service

Under this scenario, six of the 14 study intersections are expected to continue to operate at an acceptable service levels (LOS D or better) during the a.m. and p.m. peak hours (similar to without project conditions).

The following seven intersections would require mitigations in order to account for additional demand due to the proposed development:

- Golden Valley Parkway and Spartan Way (Intersection 1) would continue to operate at LOS E during the a.m. peak hour and at LOS F during the p.m. peak hour. Delays would increase by 1.3 seconds per vehicle during the a.m. peak hour and by 7.3 seconds per vehicle during the p.m. peak hour.
  - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the signal is anticipated to operate with substantially less delay during both peak hours as compared to Cumulative Conditions.
- Golden Valley Parkway and River Islands Parkway (Intersection 3) continues to operate at LOS F during both peak hours and would experience increases in delay of 27.5 seconds per vehicle during the a.m. peak hour and 31.3 seconds per vehicle during the p.m. peak hour.
  - It is recommended that the signal timings of the intersection be changed slightly[1] and the northbound right and southbound right turning movements operate with overlap phases.

With these changes, the intersection would operate with less delay than under Cumulative Conditions.

- River Islands Parkway and McKee Boulevard (Intersection 5) degrades from LOS D to LOS E during the a.m. peak hour and degrades from LOS E to LOS F during the p.m. peak hour.
    - It is recommended that the signal timings of the intersection be changed slightly[1] and that the northbound right turning movement operate with an overlap. With these changes, the intersection would operate better than Cumulative Conditions.
- River Islands Parkway and Street C (Intersection 10) operates at LOS F under one-way stop control.
    - It is recommended that the intersection be signalized and that a southbound right turn lane and an eastbound left turn lane be added. With these improvements, the intersection is projected to operate overall at LOS B during both peak hours.
- Spartan Way / Lathrop Road at I-5 NB Ramps (Intersection 11) continues to operate at LOS F during both peak hours and would experience an increase in delay of 4.5 seconds per vehicle during both peak hours.
    - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate with slightly less vehicular delay than under Cumulative Conditions.
- Spartan Way / Lathrop Road at I-5 SB Ramps (Intersection 12) continues to operate at LOS F during the a.m. and p.m. peak hours. The intersection would experience an increase in delay of 4.1 seconds per vehicle during the a.m. peak hour and 16.3 seconds per vehicle during the p.m. peak hour.
    - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate similarly to Cumulative Conditions.
- River Island Parkway / Louise Avenue at I-5 SB Ramps (Intersection 14) continues to operate at LOS F during both peak hours and would experience an increase in delay of 88.6 seconds per vehicle during the a.m. peak hour and 85.4 seconds per vehicle during the p.m. peak hour.
    - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate with less vehicular delay than compared to Cumulative Conditions during both peak hours. It should be noted, however, that the intersection would continue to operate with hundreds of seconds of delay.
    - To improve operations, physical modifications to the interchange ramp would be necessary. The City is currently assessing potential improvements to the interchange ramps. It is expected that with geometric improvements, delays at the intersection would substantially decrease.

The following intersection would experience **significant and unavoidable inconsistencies** with City standards due to additional traffic generated by the proposed development:

- River Island Parkway / Louise Avenue at I-5 NB Ramps (Intersection 13) continues to operate at LOS F during both peak hours. With the additional site generated traffic, the intersection experiences an increase in delay by 40.2 seconds per vehicle during the a.m. peak hour and 60.1 seconds per vehicle during the p.m. peak hour.
  - To improve conditions, physical modifications to the interchange ramp would be necessary. The City is currently assessing potential improvements to the interchange ramps. It is expected that with geometric improvements, delays at the intersection would substantially decrease.
  - Of note, the City's General Plan (2022) states an exception to the LOS D standard "where constructing facilities with sufficient capacity would be unreasonably expensive." TJKM suggests that the project contribute a portion of funding towards improvements to the interchange relative to its fair share (approximately 10.26 percent).

Site Access & On-Site Circulation

The project would be accessed by one intersection on River Island Parkway and two intersections on Barbara Terry Boulevard. All driveways will be full access. Any proposed landscaping should be maintained to provide adequate sight distance. The proposed driveway locations, designs, and sight distances are expected to be all ***adequate***.

Parking

Based on City of Lathrop parking requirements, one-family dwelling units shall have garages that can accommodate two spaces. Additionally, at least one on-street parking shall be provided for each single-family resident within any residential zoning district. The site is anticipated to conform to City standards. Thus, site parking is expected to be ***adequate***.

Pedestrian Impacts

Pedestrian access to the project site is facilitated by sidewalks and crosswalks along River Island Parkway and Barbara Terry Boulevard. The proposed development project does not conflict with existing and planned pedestrian facilities; therefore, the impact to pedestrian facilities is expected to be ***less-than-significant***.

Bicycle Impacts

There is an existing Type II bicycle facility on River Island Parkway near the project vicinity. The project does not conflict with existing and planned bicycle facilities; therefore, the impact to bicycle facilities is expected to be ***less-than-significant***.

Transit Impacts

The project site is within a 1.5 mile of two San Joaquin RTD bus stops, located on the northwest corner of East Louis Avenue/Harlan Road Intersection. Impacts to transit service are expected to be ***less-than-significant.***

1.0 INTRODUCTION

This report summarizes the results of the Traffic Impact Analysis (TIA) for the proposed Mossdale West development (project) in the City of Lathrop (City), California. The project site is located east of the fork between the Old River and the San Joaquin River, north of River Island Parkway, south of Barbara Terry Boulevard, and west of McKee Boulevard.

1.1 Project Description

The project proposes to develop approximately 912 single-family residential dwelling units. The project will include various driveways to serve as entry points for passenger vehicles.

The following section discusses the TIA purpose, study intersections, and analysis scenarios.

1.2 Project Purpose

The purpose of the TIA is to evaluate the impacts on the transportation infrastructure due to the addition of traffic from the proposed project. The report includes evaluations and recommendations concerning project site access, on-site circulation for vehicles, bicycles, and pedestrians, and parking supply.

1.3 Study Area

The study area is located within the city limits of Lathrop. The impacts of the proposed project were evaluated for the study intersections discussed below.

1.3.1 Study Intersections

TJKM evaluated traffic conditions at 14 study intersections during the a.m. and p.m. peak hours for a typical weekday. The study intersections were selected in consultation with the City of Lathrop staff. The peak periods in the City of Lathrop are between 6–9 a.m. and 3–6 p.m. The study intersections and their existing associated traffic control types and configurations are as follows:

1. Golden Valley Parkway and Spartan Way (3-legged, signalized)
2. Golden Valley Parkway and Stanford Crossing Drive (4-legged, signalized)
3. Golden Valley Parkway and River Islands Parkway (4-legged, signalized)
4. Golden Valley Parkway and Town Center Drive (4-legged, signalized)
5. River Island Parkway and McKee Boulevard (4-legged, signalized)
6. Barbara Terry Boulevard and McKee Boulevard (4-legged, all-way stop control)
7. Barbara Terry Boulevard and Marsh Road (3-legged, one-way stop control)
8. Barbara Terry Boulevard and Sierra Mar Road (3-legged, one-way stop control)
9. Barbara Terry Boulevard and Towne Centre (future intersection)
10. River Islands Parkway and Street C (future intersection)
11. Spartan Way/Lathrop Road and I-5 NB ramps (4-legged, signalized)
12. Spartan Way/Lathrop Road and I-5 SB ramps (4-legged, signalized)

13. River Islands Parkway/Louise Avenue and I-5 NB ramps (4-legged, signalized)
14. River Islands Parkway/Louise Avenue and I-5 SB ramps (4-legged, signalized)

Note that the area surrounding the project site is undergoing development at a rapid pace at the time of this TIA's writing. As a result, the above control types and configurations might have changed since the analysis was conducted.

Figure 1 illustrates the study intersections and the vicinity map of the proposed project. **Figure 2** shows the proposed project site plan. Please note that the site plan shows a particular configuration of the proposed project with 829 single-family dwelling units. The proposed project is planned to implement 829 to 912 single-family dwelling units. For the purposes of this traffic study, the configuration of the proposed project with 912 single-family dwelling units was analyzed to be conservative.

1.4 Analysis Scenarios

This study analyzes the following traffic scenarios:

- 2022 Existing Conditions;
- 2022 Existing Conditions plus Project;
  - Includes the Mossdale West development.
- 2026 Baseline Conditions;
  - Includes approved developments that are expected to be completed and in operation in the near future.
- 2026 Baseline Conditions plus Project;
  - Includes approved developments that are expected to be completed and in operation in the near future, and the Mossdale West development.
- 2040 Cumulative Conditions;
  - Includes approved developments that are expected to be completed and in operation in the near future and accounts for additional growth within the region.
- 2040 Cumulative Conditions plus Project;
  - Includes approved developments that are expected to be completed and in operation in the near future, accounts for additional growth within the region, and the Mossdale West development.

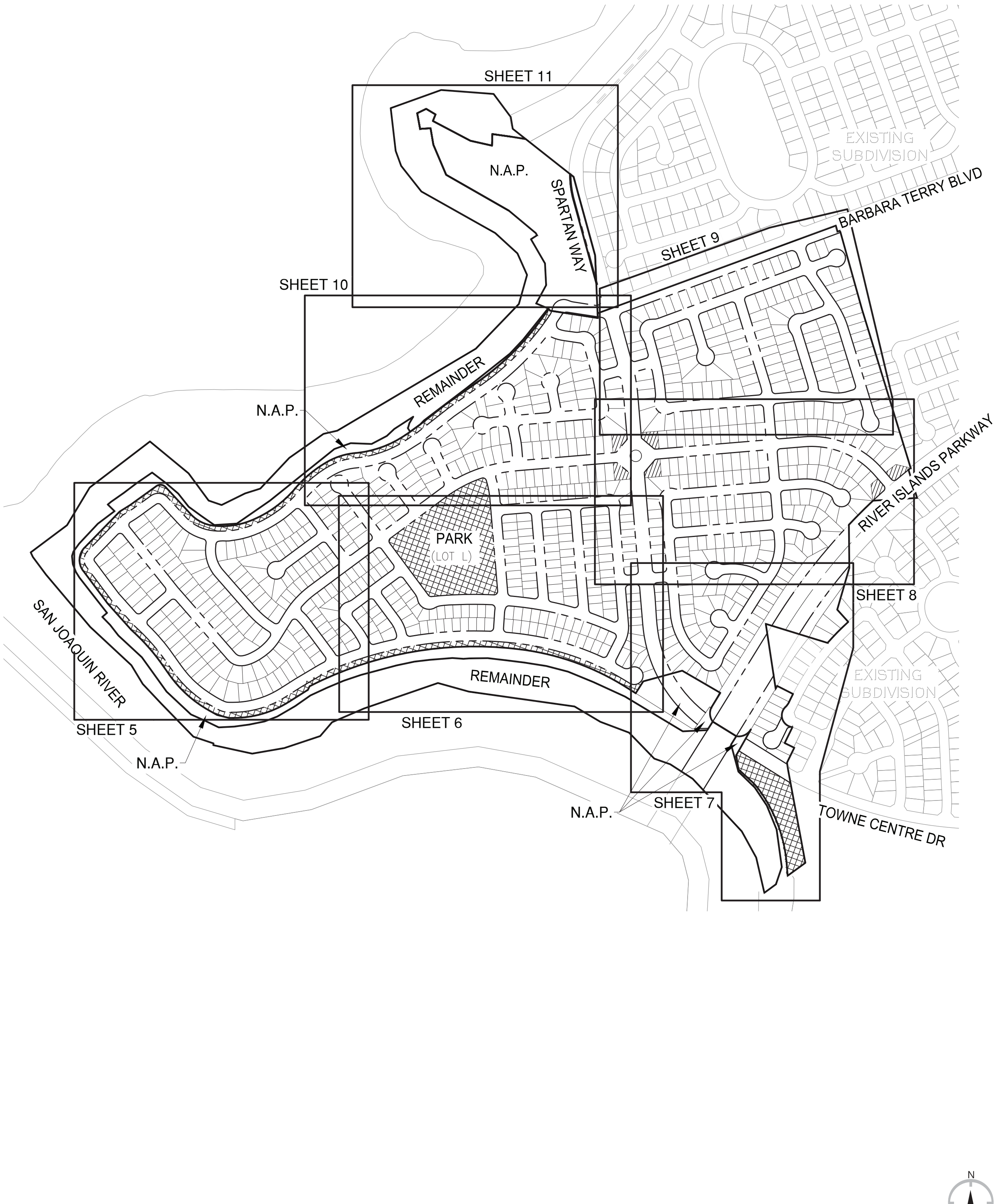
Figure 1: Vicinity Map

LEGEND

Project Site

Study Intersection

Figure 2: Site Plan



2.0 STUDY METHODOLOGY

Traffic impacts related to the proposed project were evaluated for both compliance with applicable regulatory documents and environmental significance as defined in the California Environmental Quality Act (CEQA). In accordance with the Technical Advisory published by the Governor's Office of Planning and Research (OPR), a Vehicle Miles Traveled (VMT) analysis forms the basis of the CEQA analysis for the proposed project. Effective as of July 1, 2020, intersection level of service (LOS) can no longer be used to determine significant impacts for CEQA purposes.

The City of Lathrop adopted VMT thresholds and screening criteria on September 14, 2020.

2.1 Vehicle Miles Traveled

This study includes a quantitative analysis of VMT generated by the proposed project. California Senate Bill (SB) No. 743 is intended to reduce greenhouse gas emissions and particulates, encourage infill development and a diversity of uses instead of sprawl, and promote multi-modal transportation networks.

The San Joaquin COG 2018 RTP Model was used to evaluate changes in VMT due to land use developments. For the purposes of this study, the screening guidelines and significance thresholds that are contained in the City's VMT guidelines are utilized. If a project does not meet any screening criteria, the draft guidelines specify use of the San Joaquin COG RTP Travel Demand Model to identify the appropriate project VMT.

City of Lathrop Screening Criteria

The adopted guidelines include the following screening criteria for identifying projects that can be presumed to have a less-than-significant impact:

- Small projects,
- Projects located in low VMT areas,
- Projects in proximity to a major transit stop,
- Affordable housing,
- Local serving retail, and
- Transportation projects.

Significance Standards

The state of California provides lead agencies latitude in adopting standards of significance for evaluating VMT impacts associated with land use projects. For this project, the City of Lathrop SB 743 guidelines were used to analyze the proposed project.

Based on the City's guidelines, for a project to be VMT insignificant, the project has to generate 15 percent below the area-wide average for the total home-based VMT statistic. If the project generates a higher VMT, then the project would be considered to have a "significant" impact.

2.2 Level of Service

Level of service (LOS) standards are no longer used for identifying impacts under CEQA, however level of service analysis is still used for determining consistency with adopted agency plans and standards. Where standards refer to significant environmental impacts, this analysis instead identifies these as significant inconsistencies with adopted plans.

Level of service (LOS) is a qualitative measure that describes operational conditions as they relate to the traffic stream and perceptions by motorists and passengers. The LOS generally describes these conditions in terms of such factors as speed and travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience and safety. The operational LOS are given letter designations from "A" to "F", with "A" representing the free-flow operating conditions and "F" representing the severely congested flow with high delays. Typically, LOS "C" is considered as an ideal condition as it represents stable flow and efficient use of the transportation facility. Intersections generally are the capacity-controlling locations with respect to traffic operations on arterial and collector streets. The following sections provide detailed study methodology based on the type of intersections.

Each of the study intersections was analyzed using *Synchro* Version 11 software using methodology presented in the Transportation Research Board's (TRB) Highway Capacity Manual (HCM) 6th Edition. The LOS assessment under all scenarios is based on current traffic controls unless otherwise noted.

Signalized Intersections Methodology

The study intersections under traffic signal control were analyzed using the HCM 6th Edition methodology for signalized intersections described in Chapter 19. This methodology determines LOS based on average control delay per vehicle for the overall intersection during peak hour intersection operating conditions.

Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. **Table 1** summarizes the relationship between the control delay and LOS for signalized intersections. The LOS assessment under all scenarios is based on current traffic controls and optimized signal timing unless otherwise noted.

The LOS methodology for signalized intersections is described in detail in **Appendix A**.

Table 1: Level of Service Definitions for Signalized Intersections

LOS	Definition	Control Delay Range (sec/veh)	v/c Range
A	Very low control delay. This level is typically assigned when the v/c ratio is low and either progression is exceptionally favorable or the cycle length is short. Most vehicles arrive during the green phase. Many vehicles do not stop at all.	≤ 10	≤ 1.0
B	The v/c ratio is low. There is good progression, short cycle lengths, or both. More vehicles stop, causing higher levels of delay.	≤ 20	≤ 1.0
C	Higher delays occur in favorable progression or a due to a moderate cycle length, or both. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during a given cycle) may begin to appear. The number of vehicles stopping is still considered low-to-moderate, though many vehicles still pass through the intersection without stopping.	≤ 35	≤ 1.0
D	The influence of congestion becomes more apparent. Longer delays may result from some combination of a high v/c ratio, ineffective progression, long cycle length, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	≤ 55	≤ 1.0
E	Typically considered the limit of acceptable delay. High delays usually indicate a very high v/c ratio, poor progression, long cycle lengths, and high volumes. Most cycles fail to clear the queue.	≤ 80	≤ 1.0
F	Delays are unacceptable to most drivers. Conditions are considered oversaturated. Arrival flow rates exceed the capacity of the intersection (v/c in excess of 1.0). Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.	> 80	> 1.0

Source: Transportation Research Board's (TRB) Highway Capacity Manual (HCM), 6th Edition

Stop-Controlled Intersections Methodology

The study intersections under one/two-way stop control and all-way stop control were analyzed using the HCM 6th Edition methodology described in Chapter 20 and 21, respectively. LOS ratings for stop-sign controlled intersections are based on the average control delay expressed in seconds per vehicle.

At one- or two-way stop controlled intersections, the control delay is calculated for each movement, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The weighted average delay for the entire intersections is presented for all-way stop controlled intersections.

Table 2 summarizes the relationship between delay and LOS for stop-controlled intersections. The delay ranges for unsignalized intersections are lower than for signalized intersections, as drivers expect less delay at stop-controlled intersections.

The LOS methodology for stop-controlled intersections is described in detail in **Appendix A**.

Table 2: Level of Service Definitions for Stop Controlled Intersections

LOS	Definition	Control Delay Range (sec/veh)	v/c Range
A	Usually no conflicting traffic. Drivers can easily find gaps in traffic to maneuver. v/c is low.	≤ 10	≤ 1.0
B	Occasionally some delay due to conflicting traffic. Drivers can find gaps in traffic. v/c is low.	≤ 15	≤ 1.0
C	There is some noticeable delay due to conflicting traffic. Drivers are still able to find gaps in traffic.	≤ 25	≤ 1.0
D	Drivers experience delay due to less gaps in traffic to maneuver. Lane group v/c creeps closer to 1.0.	≤ 35	≤ 1.0

LOS	Definition	Control Delay Range (sec/veh)	v/c Range
E	Delay approaches driver tolerance levels. Drivers will occasionally find gaps in traffic to maneuver. Lane group v/c approaches 1.0.	≤ 50	≤ 1.0
F	Delay exceed driver tolerance levels or v/c exceeds 1.0 or both.	> 50	> 1.0

Source: Transportation Research Board's (TRB) Highway Capacity Manual (HCM), 6th Edition

Significance Standards for Signalized and Stop Controlled Intersections

As per the City's General Plan (2022), the City of Lathrop LOS standard (CIR-1.3) is to strive for LOS D for intersections, except when maintaining such levels of service is infeasible:

- Where maintaining the standard would be a disincentive to walking, bicycling, or transit.
- Where maintaining the standard would be incompatible with adjacent land uses.
- Where constructing facilities would prevent the City from achieving goals of VMT or other priorities.
- Where constructing facilities with sufficient capacity would be unreasonably expensive.

Thus, for the purposes of this report, intersections that are expected to operate below LOS D will be considered as impacted and should be considered for mitigation.

While the City of Lathrop does not have specific impact criteria for intersections already operating below LOS D, for the purposes of this study, a project impact would be considered substantial if:

- For intersections that already operate at unacceptable levels of service (E or F), project impacts can be considered substantial if the project trips result in an increase in delay by 5.0 seconds or more.

3.0 2022 EXISTING CONDITIONS

This section describes existing conditions in the immediate project site vicinity, including roadway facilities, bicycle and pedestrian facilities, and available transit service. In addition, existing traffic volumes and operations are presented for the study intersections, including the results of LOS calculations.

3.1 Existing Roadway System

Access to the proposed project will be provided via River Islands Parkway and Barbara Terry Boulevard.

A description of the existing road systems is provided below:

Golden Valley Parkway is primarily a six-lane divided arterial from Spartan Way to its southern terminus at Brookhurst Boulevard. Golden Valley Parkway will serve as the primary north-south arterial for residents in Mossdale Village and Central Lathrop. Much of the land surrounding Golden Valley Parkway is currently being developed, Golden Valley Parkway will provide access to single-family homes and Lathrop Marketplace. In the project vicinity, the posted speed limit is 50 miles per hour (mph) north of River Island Parkway and 45 mph south of River Island Parkway.

Spartan Way / Lathrop Road is primarily a four- to six-lane divided arterial from its western terminus at Barbara Terry Boulevard and its eastern terminus at Austin Road in Manteca. In the project vicinity, the majority of land uses will be primarily single-family homes and educational facilities. The posted speed limit on Lathrop Road / Spartan Way is 35 mph.

Stanford Crossing Drive is primarily a two-lane undivided road that spans from Spartan Way to Golden Valley Parkway.

River Islands Parkway / Louise Avenue is primarily a four- to six-lane divided arterial that runs east-west through the City of Lathrop. To the west, the roadway terminates near the Old River. From there, the roadway extends several miles eastward and terminates at Ripon Road, near French Camp Road. The roadway currently tapers to two-lanes crossing the San Joaquin River. It is intended that the river crossing will ultimately be widened to four-lanes. In the project vicinity, River Islands Parkway primarily serves for residents in Mossdale Village and Central Lathrop and has a posted speed limit of 45 mph.

Town Centre Drive is primarily a two-lane undivided road from Village Avenue to Manthey Road. The roadway has a posted speed limit of 25 mph. In the vicinity of the site, Town Center Drive primarily serves single-family homes.

Barbara Terry Boulevard is primarily a two-lane undivided road from Locomotive Street to Lathrop Road and has a posted speed limit of 35 mph.

McKee Boulevard is a two-lane undivided road in the project vicinity. The posted speed limit on Mckee Boulevard is 35 mph.

3.2 Existing Pedestrian Facilities

Walkability is defined as the ability to travel easily and safely between various origins and destinations without having to rely on automobiles or other motorized travel. The ideal "walkable" community includes wide sidewalks, a mix of land uses (such as residential, employment, and shopping opportunities), a limited number of conflict points with vehicle traffic, easy access to transit facilities and services and a network of pedestrian facilities.

Pedestrian facilities are comprised of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access the destinations such as institutions, businesses, public transportation, and recreation facilities.

Near the proposed project site, the approximate width of the sidewalk on both sides of the River Island Parkway is eight feet. There is currently an approximately six-foot wide sidewalk along Barbara Terry Boulevard on one side of the street.

The signalized intersections near the proposed development provide marked crosswalks and pedestrian push buttons and signal heads.

The existing pedestrian facilities in the study area are shown in **Figure 3**.

3.3 Existing Bicycle Facilities

The 1995 City of Lathrop Bicycle Transportation Plan outlines policies and objectives to improve the current active bicycle facilities. The various bicycle facilities are described below:

- **Class I Bikeways (Bike Paths or Shared-Use Path)**: Class I Bikeways provide a completely separated right of way for bicycles and pedestrians with minimal crossflow by motorized vehicles. Bike paths provide a recreational opportunity or can serve as commute routes. In the project area, there are no Class I facilities.
- **Class II Bike Lanes**: Class II bike lanes are striped bike lanes immediately adjacent to a traffic lane. Bike lanes provide a pavement area separate from vehicular traffic and improve conditions for bicycles on roadways. In the project vicinity, Class II Bike Lanes are provided on River Island Parkway.
- **Class III Bike Routes**: Class III Bike Routes provide shared use of the roadway, designated by signs or pavement markings and shared with other vehicular traffic. There are no Class III Bike Routes in the project vicinity.
- **Class IV Separated Bikeways or Cycle Tracks**: Cycle tracks are separated bikeways for the exclusive use of bicycles. Cycle tracks are usually located along the roadway, but require separation from the vehicular travel lane in the form of grade separation, planters, flexible posts, or on-street parking. There are no Class IV bikeways in the project vicinity.

Existing bicycle facilities are illustrated in **Figure 3**.

3.4 Existing Transit Facilities

San Joaquin Regional Transit District (RTD) provides transit service throughout San Joaquin County. **Table 3** summarizes the existing San Joaquin RTD services in the project vicinity. Existing transit services near the project are shown in **Figure 3**.

Table 3: Existing San Joaquin RTD Transit Service

Route	From	To	Weekdays Operating Hours	Weekdays Headway (hours)	Weekends Operating Hours	Weekends Headway (minutes)
90	Tracy Transit Station	San Joaquin Delta College (Pacific & Yokuts, Stockton, CA)	5:37 a.m. – 9:11 p.m.	Varies (~1 hour)	N/A	N/A
97	Tracy Transit Station	Manteca Transit Center	6:00 a.m. – 9:00 p.m.	Varies (~1.3 hours)	N/A	N/A

Source: San Joaquin RTD Transit Website

3.5 Existing Peak Hour Traffic Volumes And Lane Configurations

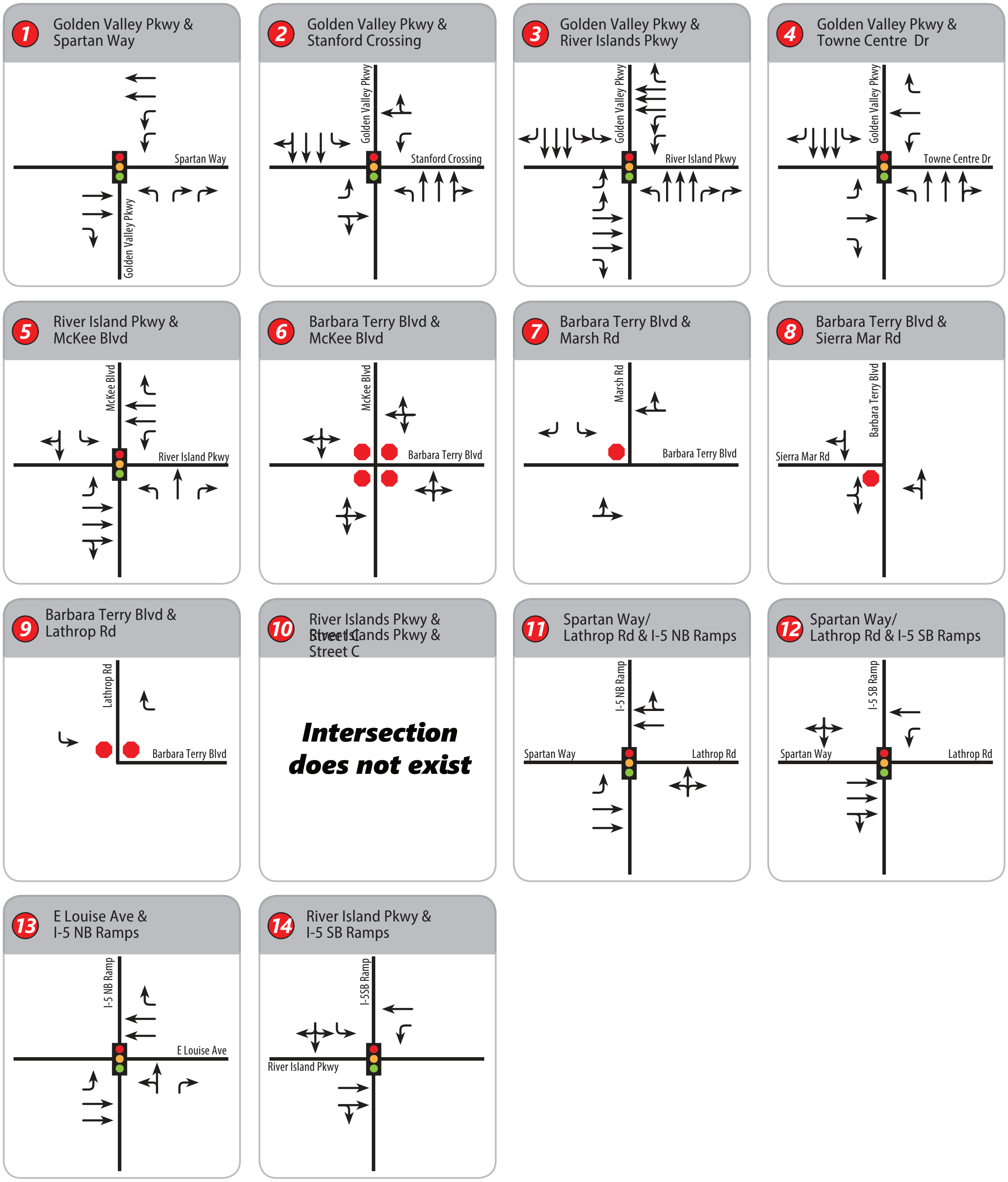
The existing operations of the study intersections were evaluated for the highest one-hour volumes during weekday morning (a.m.) and evening (p.m.) peak periods. The City of Lathrop approved the use of the projected 2022 intersection turning movement counts (TMC) from the 2022 Traffic Monitoring Program for the City of Lathrop (TMP) for the existing conditions scenario. Excerpts from the TMP are provided in **Appendix B**.

It should be noted that three of the existing study intersections along Barbara Terry Boulevard did not have data available from the TMP. To assess operations at these intersection, TMCs were collected on Tuesday, September 27, 2022. The raw TMC data is provided in **Appendix C**.

Figure 4 illustrates the existing lane geometry and traffic control type at the study intersections. **Figure 5** shows existing peak hour volumes at the study intersections on a typical weekday.

Figure 3: 2022 Existing Conditions - Pedestrian, Bicycle, and Transit Facilities

Figure 4: 2022 Existing Conditions - Lane Geometry and Traffic Control



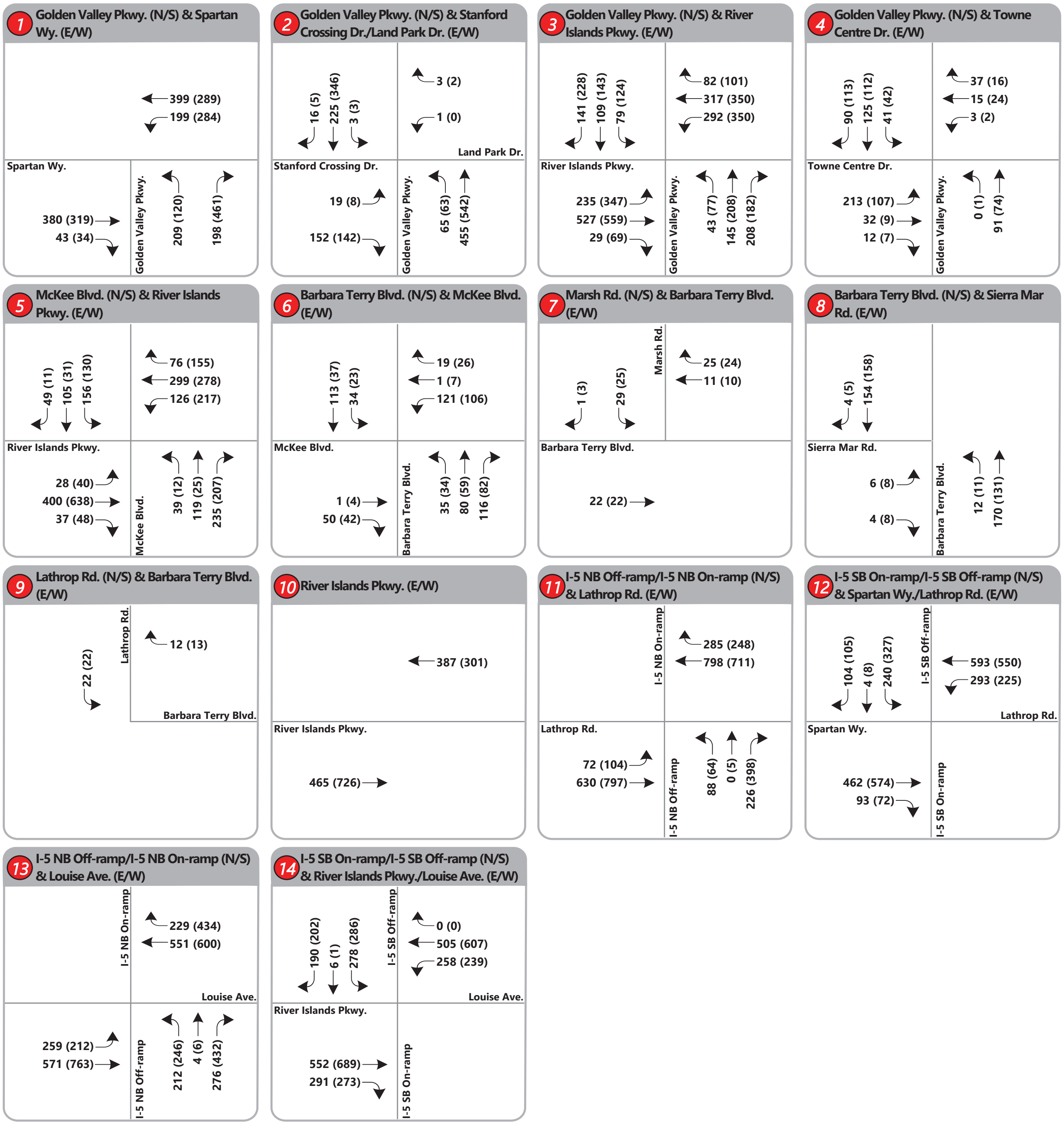
LEGEND

Stop Sign

Traffic Signal

TJKM

Figure 5: 2022 Existing Conditions - Intersection Peak Hour Traffic Volumes



LEGEND

XX AM Peak Hour Volumes

(XX) PM Peak Hour Volumes

N

3.6 Intersection Level of Service Analysis – Existing Conditions

Existing intersection lane configurations and turning movement volumes are used to calculate the LOS for the study intersections during each peak hour. Signal timing sheets for existing signalized study intersections were obtained from the City. The results of the LOS analysis using the *Synchro*, Version 11, software program for Existing Conditions are summarized in **Table 4**. Intersections that operated at LOS E or F are shown in red. Detailed calculation sheets for the Existing Conditions scenario are contained in **Appendix D**.

Under this scenario, all of the study intersections operate within jurisdictional standards (LOS D or better) during the a.m. and p.m. peak hour.

Table 4: 2022 Existing Conditions – Intersection Level of Service Analysis

No.	Intersection	Intersection Control[1]	Peak Hour[2]	Average Delay[3]	LOS[4]
1	Golden Valley Parkway (N/S) & Spartan Way (E/W)	Signal	a.m.	12.7	B
			p.m.	15.0	B
2	Golden Valley Parkway (N/S) & Stanford Crossing Drive (E/W)	Signal	a.m.	15.2	B
			p.m.	11.9	B
3	Golden Valley Parkway (N/S) & River Islands Parkway (E/W)	Signal	a.m.	22.8	C
			p.m.	31.7	C
4	Golden Valley Parkway (N/S) & Towne Center Drive (E/W)	Signal	a.m.	13.3	B
			p.m.	12.4	B
5	River Islands Parkway (N/S) & McKee Boulevard (E/W)	Signal	a.m.	28.0	C
			p.m.	27.9	C
6	Barbara Terry Boulevard (E/W) & McKee Boulevard (N/S)	AWSC	a.m.	12.5	B
			p.m.	9.6	A
7	Barbara Terry Boulevard (E/W) & Marsh Road (N/S)	OWSC	a.m.	9.2	A
			p.m.	9.0	A
8	Barbara Terry Boulevard (N/S) & Sierra Mar Road (E/W)	OWSC	a.m.	11.6	B
			p.m.	11.2	B
9	Barbara Terry Boulevard (E/W) & Towne Centre Drive (N/S)	Future Intersection	a.m.	-	-
			p.m.	-	-
10	River Islands Parkway (E/W) & Street C (N/S)	Future Intersection	a.m.	-	-
			p.m.	-	-
11	Spartan Way / Lathrop Road (E/W) & I-5 NB Ramps (N/S)	Signal	a.m.	17.9	B
			p.m.	28.7	C
12	Spartan Way / Lathrop Road (E/W) & I-5 SB Ramps (N/S)	Signal	a.m.	20.6	C
			p.m.	22.9	C
13	River Islands Parkway / Louise Avenue (E/W) & I-5 NB Ramps (N/S)	Signal	a.m.	16.1	B
			p.m.	18.2	B
14	River Islands Parkway / Louise Avenue (E/W) & I-5 SB Ramps (N/S)	Signal	a.m.	23.2	C
			p.m.	30.8	C

Notes:

1. Signal = Signalized; OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; AWSC = All-Way Stop Control
2. a.m. = a.m. peak hour; p.m. = p.m. peak hour

3. Delay measured in seconds per vehicle. For signalized and all-way stop controlled intersections, the delay represents the average control delay for all turning movements. For one- and two-way stop controlled intersections, the delay represents the worse average control delay for a given approach.
4. LOS = Level of Service; "-"= no data; not included in scenario

4.0 2022 EXISTING CONDITIONS PLUS PROJECT

This section describes the operational impacts of the proposed project on the transportation system in the immediate project site vicinity. The Existing Conditions plus Project scenario consists of existing traffic volumes and roadway facilities plus new traffic generated by the proposed project.

This section consists of two analysis components:

- A vehicle miles traveled (VMT) assessment of the proposed project (Section 4.1), and
- A level of service (LOS) assessment of study intersections (Sections 4.2 to 4.7).

The amount of traffic added to the roadway system by the proposed development is estimated using a three-step process:

- Trip Generation – Estimates the amount of traffic added to the roadway network (Section 4.2),
- Trip Distribution – Estimates the general direction of travel for site traffic to and from the project site (Section 4.3), and
- Trip Assignment – The new trips are assigned to specific street segments and intersection turning movements (Section 4.3).

4.1 Vehicle Miles Traveled

Beginning on July 1, 2020, Senate Bill (SB) 743 replaced LOS with VMT for purposes of assessing traffic impacts under the California Environmental Quality Act (CEQA), described in new Section 15064.3 of the CEQA Guidelines. Lead agencies have discretion to choose the most appropriate methodology to evaluate a project's VMT, including whether to express the change in absolute terms, per capita, per household or any other measure. VMT refers to the amount and distance of automobile travel "attributable to a project." The City of Lathrop adopted SB 743 Guidelines in September 2020.

Project Screening

The City guidelines provide standards for identifying which types of projects should be expected to not result in a significant VMT impact, and a detailed CEQA analysis would not be required to evaluate the project VMT. Since this project is not screened out, a full VMT analysis was conducted for the Mossdale West project.

VMT Forecasting

For VMT forecasting, the City of Lathrop SB 743 guidelines states that for a project to be VMT insignificant, the project has to generate 15 percent below the Citywide average for the total home-based residential VMT per capita statistic. As the City of Lathrop does not maintain its own travel demand model, the San Joaquin Council of Governments (SJCOG) 2018 Regional Transportation Plan (RTP) regional travel demand model was used to generate VMT statistics for the Mossdale West project. Per the city's guidelines, the latest approved SJCOG RTP model was used for analyzing VMT impacts for this project. Since the 2022 SJCOG RTP model have not been officially certified by the California Air Resources Board, the 2018 RTP model was used instead. In addition, the VMT analysis for this project assumes full buildout of the project in the base year condition, which are more conservative than a phased buildout through the forecast year of 2045.

The Mossdale West project is located in traffic analysis zone (TAZ) #1751 of the SJCOG Model. Currently, TAZ #1751 contains 5 people and 2 households. The full project buildout will add 912 households and 3,666 people (the people to household ratio of 4.02 was determined using Census data for the City of Lathrop) for a total of 2,695 people. **Table 5** shows the land use changes for the base year plus project SJCOG model run.

Table 5: Land Use Changes for Base Year plus Project

TAZ	***Households***	***Population***
#1751	+912	+3,666

A base year model run and a base year plus project model run were conducted with the land use changes added. The VMT results are summarized in **Table 6**.

Table 6: Home-based VMT per Employee Comparison (San Joaquin County Regional Average)

TAZ	***Base Year Average Daily Home-Based VMT per Capita (per SJCOG Model)***	***Citywide Average (per SJCOG Model)***	***15% Below Citywide Average (per SJCOG Model)***	***Base Year Plus Project Average Daily Home-Based VMT per Capita (per SJCOG Model)***
#1751	17.28	18.17	15.44	16.45

The proposed project's VMT contribution was assessed using the City of Lathrop's citywide average as its metric threshold. The existing base year home-based VMT per capita for TAZ #1751 is 17.28. Adding in the Mossdale West project lowers the home-based VMT per capita for the TAZ to **16.45**. As the citywide average for Lathrop for home-based VMT per Capita is 18.17, the significance criteria (15 percent under the citywide average) would be **15.44**.

Since the project's VMT per capita value of 16.45 is higher than the citywide threshold of 15.44, the project would produce a **significant** impact on VMT and would need to be mitigated.

VMT Mitigation

To mitigate the impacts of this project to be under the VMT per capita threshold, a decrease of **6.14** percent (or 1.01 VMT per capita) would be required for the project. Below are some methods that the Mossdale West project can use to mitigate its VMT impacts, with their mitigation percentages sourced from the *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* written by the California Air Pollution Control Officers Association.[2]

1. **Improve Pedestrian Network** – This strategy focuses on creating a pedestrian network within the project and connecting to nearby destinations. As part of the project design, significant pedestrian network improvements have been added, such as sidewalks and trails which connect to the regional San Joaquin River trail system. Sidewalk improvements also count as a VMT reduction strategy. Up

[2] CAPCCA Handbook - https://www.caleemod.com/documents/handbook/full_handbook.pdf

to **5.7 percent** of VMT can be reduced using this strategy that is already built into the project characteristics.

2. **Implement traffic calming measures and low stress bicycle facilities** – This strategy focuses on traffic calming where the roadway network within the project encourage low vehicle speeds and volumes that are more conducive to walking and bicycling. The project includes construction of a network of bicycle lanes and multi-use trails that link the project with River Islands Parkway and Towne Center Drive. Up to **1.7 percent** of VMT can be reduced using this strategy.

Summing the total mitigation percentages from these two measures for the Mossdale West project results in a VMT reduction of **7.4 percent,** which is greater than the 6.14 percent needed. The mitigation measures above will reduce the daily VMT per capita for the Mossdale West project to a less than significant level for the base year with project condition. Since these mitigation measures are already part of the project, no additional mitigation measures are necessary for this project to be VMT-compliant under SB743.

Consistent with the City of Lathrop's SB743 guidelines, once a project has mitigated its base year VMT impacts to a less than significant level, it can be assumed that the project would not have a cumulative VMT impact in the forecast year.

4.2 Project Trip Generation

The project is expected to ultimately consist of approximately 912 single-family residential dwelling (SFDU) units.

In order to determine the number of trips generated by the proposed development during the weekday morning (a.m.) and weekday afternoon (p.m.) peak hours, as well as during a typical weekday, the Institute of Transportation Engineers' (ITE) Trip Generation, 11th Edition, was utilized. The project's anticipated trip generation is illustrated in **Table 7**.

ITE Land Use Code (LUC) 210 (Single-Family Detached Homes) was used for the trip generation calculations. No internal trip capture or pass-by reductions were assumed.

Table 7: Site Trip Generation (ITE 11th Ed.; Peak Hour of the Adjacent Street)

	Size		Daily		AM Peak Hour					PM Peak Hour				
			Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Proposed Use														
Single-Family Detached Housing	912	DU[1]	9.43	8,600	0.7	26:74	166	472	638	0.94	63:37	540	317	857
Net Total				**8,600**			**166**	**472**	**638**			**540**	**317**	**857**

Notes:

1. DU = dwelling unit

The proposed Mossdale West development is projected to generate approximately 8,600 daily trips, of which 638 trips (166 in, 472 out) occur during the a.m. peak hour and 857 trips (540 in, 317 out) occur during the p.m. peak hour.

4.2 Project Trip Distribution and Assignment

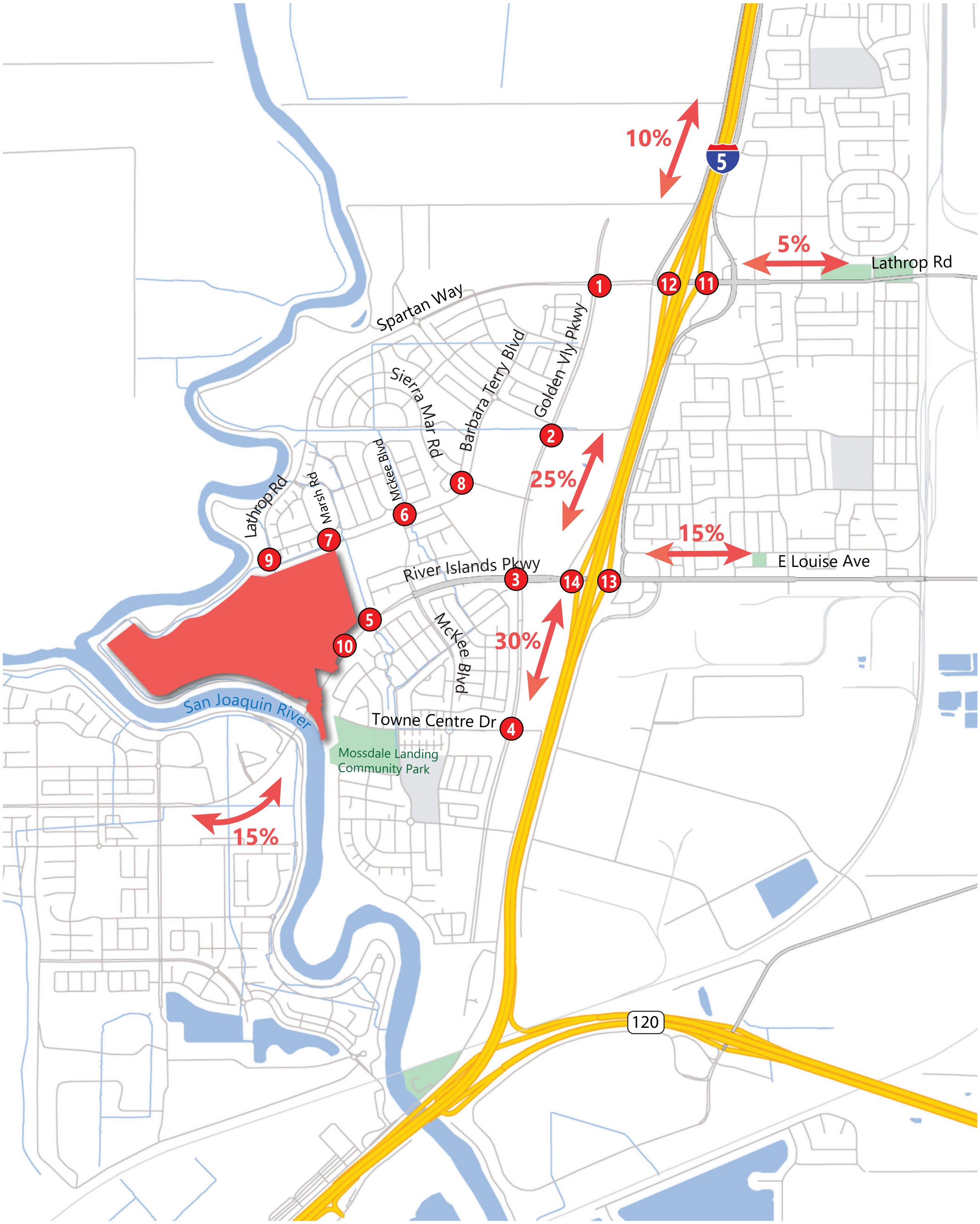
Trip distribution is a process of developing study assumptions that estimate the directions vehicular trips will arrive to and depart from the study site. Trip assignment designates specific streets and turning movements at study intersections for project-related or site traffic. Trip distribution assumptions for the proposed project are developed based on existing travel patterns, knowledge of the study area, engineering judgment, and input received from City staff.

The following trip distribution was applied for both a.m. and p.m. peak hour project-related vehicular trips:

- 10 percent to/from North via Spartan Way and I-5,
- 5 percent to/from Northeast via Spartan Way/W Lathrop,
- 25 percent to/from North via River Island Parkway and I-5,
- 15 percent to/from East via River Island Parkway,
- 30 percent to/from South via River Island Parkway and I-5, and
- 15 percent to/from West via River Island.

Figure 6 and **Figure 7** illustrate the trip distribution and trip assignment for project-related vehicular trips, respectively.

Figure 6: Trip Distribution



LEGEND

Project Site

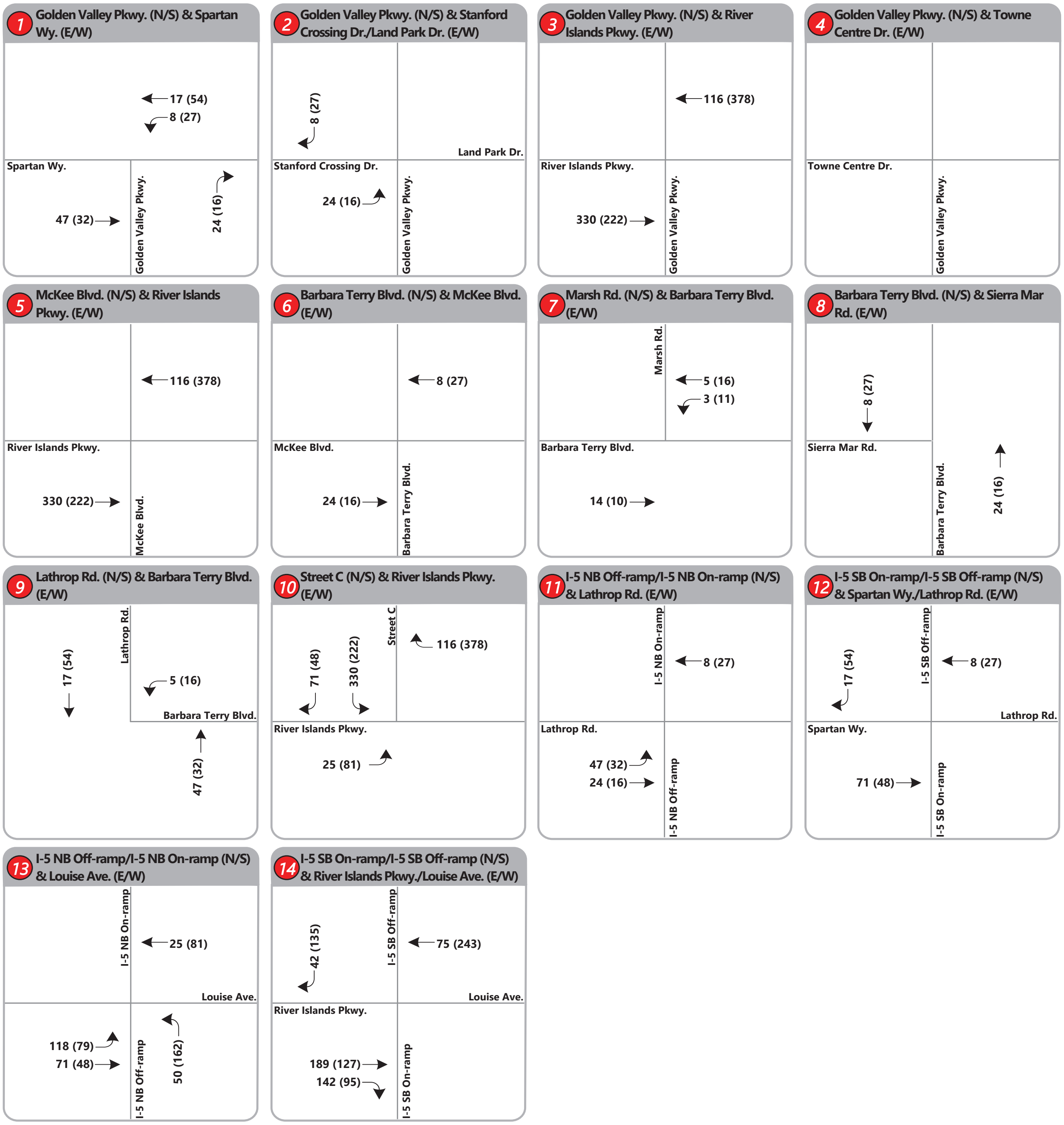
XX% Trip Distribution

X Study Intersection

N

TJKM

Figure 7: Trip Assignment



LEGEND

XX AM Peak Hour Volumes

(XX) PM Peak Hour Volumes

N

4.3 Intersection Level of Service Analysis – Existing Conditions plus Project

The intersection level of service analysis results for the Existing Conditions plus Project scenario are summarized in **Table 8**. Intersections that operated at LOS E or F are shown in red. The results for the Existing Conditions scenario are included for comparison purposes. Detailed calculation sheets for the Existing Conditions plus Project scenario are contained in **Appendix E**.

Figure 8 displays projected peak hour turning movement volumes, lane geometry, and traffic controls at all of the study intersections for the Existing Conditions plus Project scenario.

Under this scenario, 13 of the 14 study intersections are expected to continue to operate at acceptable service levels (LOS D or better) during the a.m. and p.m. peak hours.

The following intersection would degrade from acceptable to unacceptable level of service with the addition of project traffic:

- River Islands Parkway and Street C (Intersection 10) operates at LOS F under one-way stop control.
    - It is recommended that the intersection be signalized and with the addition of a southbound right turn lane and an eastbound left turn lane. It is anticipated that a signal would be warranted per the California Manual on Uniform Traffic Control Devices (CA MUTCD) based on the given volume. With these improvements, the intersection is projected to operate overall at LOS B during both peak hours.

With the proposed improvements in place, the proposed development would have a negligible impact on the surrounding road network under Existing Conditions.

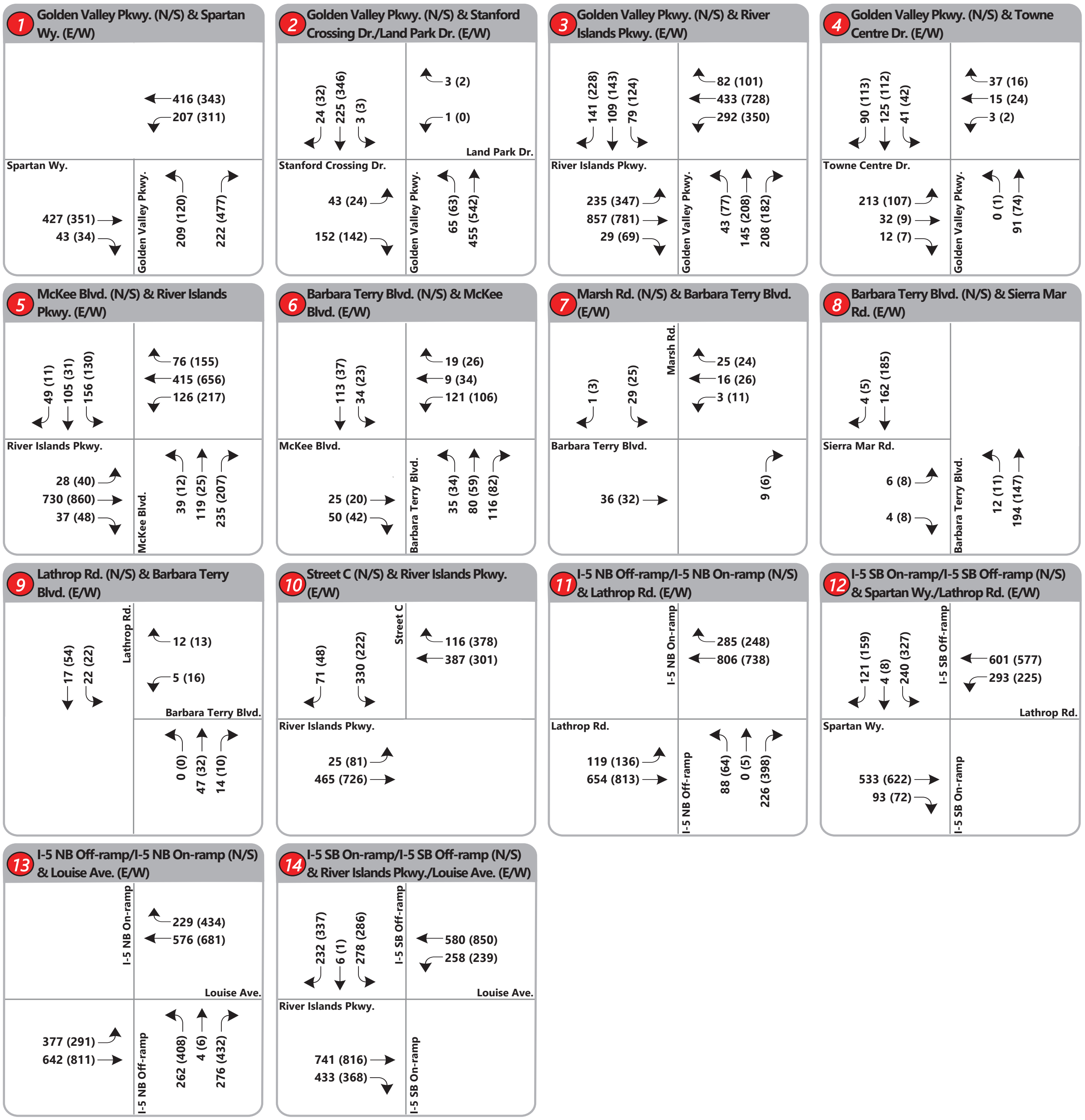
Table 8: Intersection Level of Service Analysis – 2022 Existing Conditions plus Project

No.	Intersection	Intersection Control[1]	Peak Hour[2]	Existing Average Delay[3]	Existing LOS[4]	Existing + Project Average Delay[3]	Existing + Project LOS[4]	Change in Delay[5]
1	Golden Valley Parkway (N/S) & Spartan Way (E/W)	Signal	AM	12.7	B	13.2	B	+0.5
			PM	15.0	B	15.9	B	+0.9
2	Golden Valley Parkway (N/S) & Stanford Crossing Drive (E/W)	Signal	AM	15.2	B	15.4	B	+0.2
			PM	11.9	B	12.1	B	+0.2
3	Golden Valley Parkway (N/S) & River Islands Parkway (E/W)	Signal	AM	22.8	C	24.6	C	+1.8
			PM	31.7	C	39.4	D	+7.7
4	Golden Valley Parkway (N/S) & Towne Center Drive (E/W)	Signal	AM	15.3	B	15.3	B	0.0
			PM	15.4	B	15.4	B	0.0
5	River Islands Parkway (N/S) & McKee Boulevard (E/W)	Signal	AM	29.4	C	33.9	C	+4.5
			PM	28.7	C	30.6	C	+1.9
6	Barbara Terry Boulevard (E/W) & McKee Boulevard (N/S)	AWSC	AM	12.5	B	13.1	B	+0.6
			PM	9.6	A	10.2	B	+0.6
7	Barbara Terry Boulevard (E/W) & Marsh Road (N/S)	OWSC (Existing) / TWSC (Future)	AM	9.2	A	9.7	A	+0.5
			PM	9.0	A	9.6	A	+0.6
8	Barbara Terry Boulevard (N/S) & Sierra Mar Road (E/W)	OWSC	AM	11.6	B	11.9	B	+0.3
			PM	11.2	B	11.8	B	+0.6
9	Barbara Terry Boulevard (E/W) & Towne Centre Drive (N/S)	OWSC (Future)	AM	-	-	8.8	A	-
			PM	-	-	9.0	A	-
10	River Islands Parkway (E/W) & Street C (N/S)	OWSC (Future)	AM	-	-	**195.3**	**F**	-
			PM	-	-	**399.6**	**F**	-
	(Mitigation: Install traffic signal; SBR lane at entrance and EBL turn lane as protected.)	*MIT: Signal*	*AM*			*11.4*	*B*	-
			PM			*12.0*	*B*	-
11	Spartan Way / Lathrop Road (E/W) & I-5 NB Ramps (N/S)	Signal	AM	17.9	B	21.0	C	+3.1
			PM	28.7	C	32.6	C	+3.9
12	Spartan Way / Lathrop Road (E/W) & I-5 SB Ramps (N/S)	Signal	AM	20.6	C	22.6	C	+2.0
			PM	22.9	C	27.8	C	+4.9
13	River Islands Parkway / Louise Avenue (E/W) & I-5 NB Ramps (N/S)	Signal	AM	16.1	B	20.9	C	+4.8
			PM	18.2	B	23.8	C	+5.6
14	River Islands Parkway / Louise Avenue (E/W) & I-5 SB Ramps (N/S)	Signal	AM	17.4	B	23.4	C	+6.0
			PM	17.9	B	30.2	C	+12.3

Notes:

1. Signal = Signalized; OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; AWSC = All-Way Stop Control
2. a.m. = a.m. peak hour; p.m. = p.m. peak hour
3. Delay measured in seconds per vehicle. For signalized and all-way stop controlled intersections, the delay represents the average control delay for all turning movements. For one- and two-way stop controlled intersections, the delay represents the worse average control delay for a given approach.
4. LOS = Level of Service; "-"= no data; not included in scenario

Figure 8: 2022 Existing Conditions plus Project - Intersection Peak Hour Traffic Volumes



LEGEND

XX AM Peak Hour Volumes
(XX) PM Peak Hour Volumes

N

01/2024

TJKM

5.0 2026 BASELINE CONDITIONS

This section presents the results of the level of service calculations under Baseline Conditions without the project. Level of service analyses at the study intersections were conducted for Baseline Conditions to evaluate the impacts due to the addition of traffic from the proposed project.

5.1 Intersection Level of Service Analysis – Baseline Conditions

Based on discussions with the City, the 2026 Baseline volumes for the study intersections were established using 2026 projected volumes in the 2022 Traffic Monitoring Program for the City of Lathrop (TMP). Excerpts from the TMP are provided in **Appendix B**.

The expected growth in the City of Lathrop for the year 2026 includes:

- 1,300 new single family residences,
- 4,000,000 additional square feet of warehouse/distribution facilities,
- 212 hotel rooms,
- 125,200 additional square feet of commercial uses, and
- New high school and K-8 facilities for 350 students.

The following improvements were also considered based on the TMP:

- The widening of River Island Parkway from 2-lanes to 4-lanes across the San Joaquin River,
- The addition of a fourth leg to the intersection of Golden Valley Parkway and Spartan Way (Intersection 1), and
- The addition of a second eastbound left turn lane at the intersection of Golden Valley Parkway and River Island Parkway (Intersection 3).

Figure 9 displays projected peak hour turning movement volumes at all of the study intersections for the Baseline scenario.

The intersection LOS analysis results for Baseline Conditions are summarized in **Table 9**. Intersections that operate at LOS E or F are shown in red. Detailed calculation sheets for Baseline Conditions are contained in **Appendix F**.

Under this scenario, six of the 12 existing study intersections are expected to continue to operate at acceptable service levels (LOS D or better) during the a.m. and p.m. peak hours. The following intersections are projected to operate at unacceptable levels of service:

- Golden Valley Parkway and Spartan Way (Intersection 1) operates at LOS F during the p.m. peak hour.
- Golden Valley Parkway and River Islands Parkway (Intersection 3) operates at LOS F during both peak hours.
- Spartan Way/Lathrop Road and the I-5 ramps (Intersections 11 & 12) operate at LOS F during both peak hours.

- River Island Parkway/Louise Avenue and the I-5 ramps (Intersections 13 & 14) operate at LOS F during both peak hours.

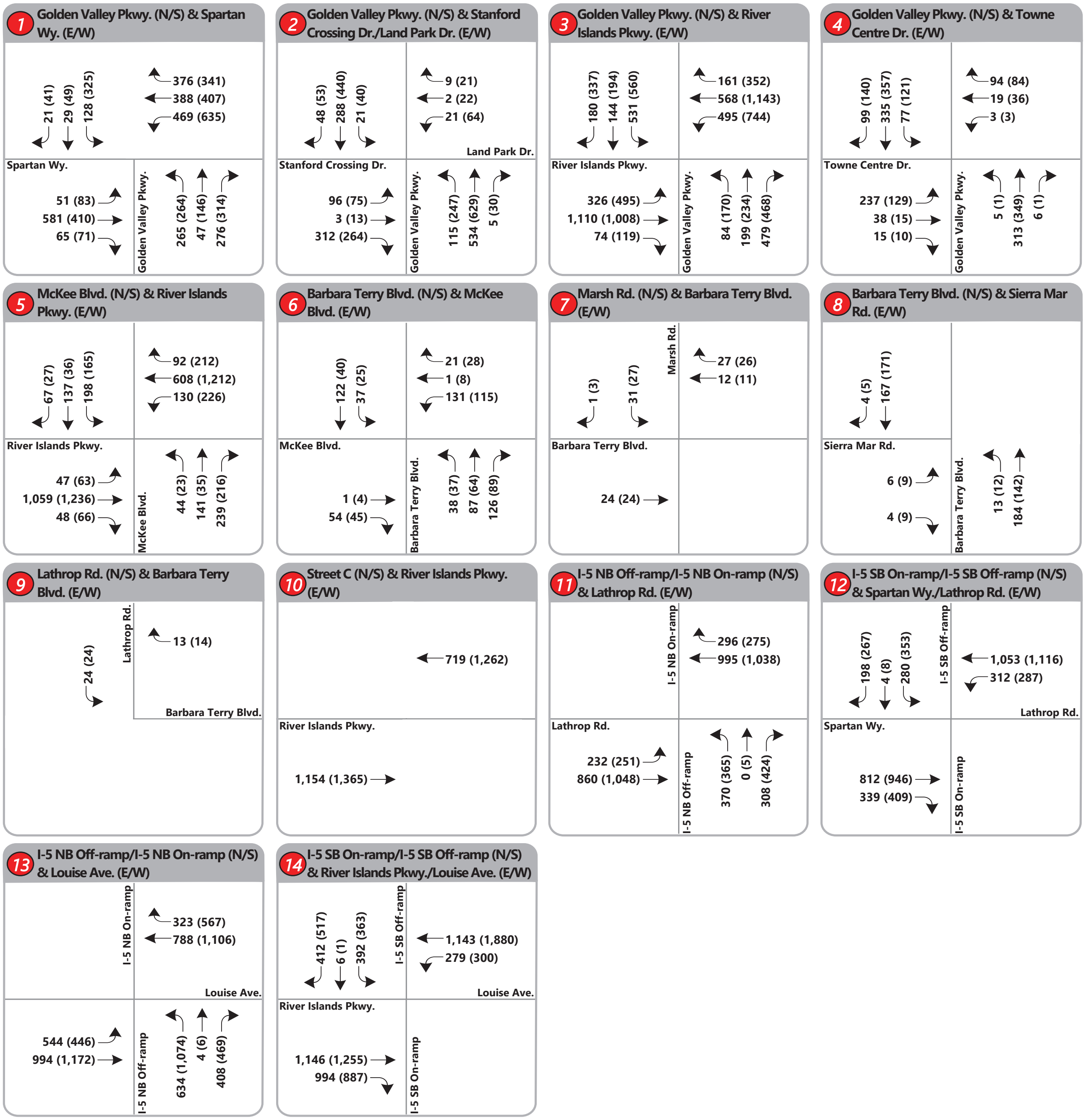
Table 9: Intersection Level of Service – 2026 Baseline Conditions

No.	Intersection	Intersection Control[1]	Peak Hour[2]	Average Delay[3]	LOS[4]
1	Golden Valley Parkway (N/S) & Spartan Way (E/W)	Signal	AM PM	52.7 **121.1**	D **F**
2	Golden Valley Parkway (N/S) & Stanford Crossing Drive (E/W)	Signal	AM PM	29.8 42.4	C D
3	Golden Valley Parkway (N/S) & River Islands Parkway (E/W)	Signal	AM PM	**83.1** **112.8**	**F** **F**
4	Golden Valley Parkway (N/S) & Towne Center Drive (E/W)	Signal	AM PM	19.7 18.7	B B
5	River Islands Parkway (N/S) & McKee Boulevard (E/W)	Signal	AM PM	49.6 48.9	D D
6	Barbara Terry Boulevard (E/W) & McKee Boulevard (N/S)	AWSC	AM PM	13.8 10.0	B A
7	Barbara Terry Boulevard (E/W) & Marsh Road (N/S)	OWSC	AM PM	9.2 9.0	A A
8	Barbara Terry Boulevard (N/S) & Sierra Mar Road (E/W)	OWSC	AM PM	11.9 11.6	B B
9	Barbara Terry Boulevard (E/W) & Towne Centre Drive (N/S)	Future Intersection	AM PM	- -	- -
10	River Islands Parkway (E/W) & Street C (N/S)	Future Intersection	AM PM	- -	- -
11	Spartan Way / Lathrop Road (E/W) & I-5 NB Ramps (N/S)	Signal	AM PM	**116.6** **145.9**	**F** **F**
12	Spartan Way / Lathrop Road (E/W) & I-5 SB Ramps (N/S)	Signal	AM PM	**72.6** **109.0**	**E** **F**
13	River Islands Parkway / Louise Avenue (E/W) & I-5 NB Ramps (N/S)	Signal	AM PM	**91.5** **161.7**	**F** **F**
14	River Islands Parkway / Louise Avenue (E/W) & I-5 SB Ramps (N/S)	Signal	AM PM	**227.4** **368.6**	**F** **F**

Notes:

1. Signal = Signalized; OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; AWSC = All-Way Stop Control
2. a.m. = a.m. peak hour; p.m. = p.m. peak hour
3. Delay measured in seconds per vehicle. For signalized and all-way stop controlled intersections, the delay represents the average control delay for all turning movements. For one- and two-way stop controlled intersections, the delay represents the worse average control delay for a given approach.
4. LOS = Level of Service; "-"= no data; not included in scenario

Figure 9: 2026 Baseline Conditions - Intersection Peak Hour Traffic Volumes



LEGEND

XX AM Peak Hour Volumes

(XX) PM Peak Hour Volumes

N

6.0 2026 BASELINE CONDITIONS PLUS PROJECT

This section describes the operational impacts of the proposed project on the transportation system in the immediate project site vicinity. Baseline plus Project Conditions consist of baseline traffic volumes and roadway facilities plus new traffic generated by the proposed project.

6.1 Intersection Level of Service Analysis – Baseline Conditions plus Project

The intersection level of service analysis results for the Baseline Conditions plus Project scenario are summarized in **Table 10**. Intersections that operated at LOS E or F are shown in red. The results for Baseline Conditions are included for comparison purposes. Detailed calculation sheets for Baseline Conditions plus Project are contained in **Appendix G**.

Figure 10 displays projected peak hour turning movement volumes at all of the study intersections for Baseline Conditions plus Project scenario.

Under this scenario, six of the 14 study intersections are expected to continue to operate at acceptable service levels (LOS D or better) during the a.m. and p.m. peak hours (similar to without project conditions).

The following seven intersections would require mitigations to account for additional demand due to the proposed development:

- Golden Valley Parkway and Spartan Way (Intersection 1) would operate at LOS E during the a.m. peak hour and would operate at LOS F with an increase in delay by 14.9 seconds per vehicle during the p.m. peak hour.
  - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection is anticipated to operate with less delay during both peak hours as compared to Baseline Conditions.
- Golden Valley Parkway and River Islands (Intersection 3) continues to operate at LOS F during both peak hours and would experience increases in delay of 22.7 seconds per vehicle and 23.0 seconds per vehicle during the a.m. and p.m. peak hours, respectively.
  - It is recommended that the signal timings of the intersection be changed slightly[1] and that the northbound right and southbound right turning movements operate with an overlap phase. With these changes, the intersection would operate with less delay during both peak hours as compared to Baseline Conditions.
- River Islands Parkway and McKee Boulevard (Intersection 5) degrades from LOS D to LOS E during both peak hours.
  - It is recommended that the signal timings of the intersection be changed slightly[1] and that the northbound right turning movement operate with an overlap phase to better accommodate the nearly 300 right turns per hour. With these changes, the intersection would operate similarly to Baseline Conditions in terms of vehicular delay.

- River Islands Parkway and Street C (Intersection 10) operates at LOS F under one-way stop control during both peak hours.
  - o It is recommended that the intersection be signalized and with the addition of a southbound right turn lane and an eastbound left turn lane. With these improvements, the intersection is projected to operate overall at LOS B during both peak hours.
- Spartan Way / Lathrop Road at I-5 NB Ramps (Intersection 11) continues to operate at LOS F during both peak hours and would experience an increase in delay of 7.6 seconds per vehicle and 5.5 seconds per vehicle during the a.m. peak hour and p.m. peak hour, respectively.
  - o It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate with slightly less vehicular delay than under Baseline Conditions.
- Spartan Way / Lathrop Road at I-5 SB Ramps (Intersection 12) degrades from LOS E to LOS F during the a.m. peak hour and continues to operate at LOS F during the p.m. peak hour. The intersection would experience an increase in delay of 12.2 seconds per vehicle during the a.m. peak hour and 19.1 seconds per vehicle during the p.m. peak hour.
  - o It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate with slightly less vehicular delay than under Baseline Conditions during the a.m. peak hour and would operate similarly to Baseline Conditions during the p.m. peak hour.
- River Islands Parkway / Louise Avenue at I-5 SB Ramps (Intersection 14) continues to operate at LOS F during the both peak hours and would experience an increase in delay of 82.4 seconds per vehicle during the a.m. peak hour and 92.1 seconds per vehicle during the p.m. peak hour.
  - o It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate with less delay during the a.m. and p.m. peak hours as compared to Baseline Conditions. It should be noted, however, that the intersection would continue to operate with hundreds of seconds of delay.
  - o In order to improve operates, physical modifications to the interchange ramp would be necessary. The City is currently assessing potential improvements to the interchange ramps. It is expected that with geometric improvements, delays at the intersection would substantially decrease.

The following intersection would experience **significant and unavoidable inconsistencies** with City standards due to additional traffic generated by the proposed development:

- River Island Parkway / Louise Avenue at I-5 NB Ramps (Intersection 13) continues to operate at LOS F during both peak hours. With the additional site generated traffic, the intersection experiences increases in delay of 40.1 seconds per vehicle during the a.m. peak hour and 59.6 seconds per vehicle during the p.m. peak hour.

- To improve conditions, physical modifications to the interchange ramp would be necessary. The City is currently assessing potential improvements to the interchange ramps. It is expected that with geometric improvements, delays at the intersection would substantially decrease.
- Of note, the City's General Plan (2022) states an exception to the LOS D standard "where constructing facilities with sufficient capacity would be unreasonably expensive." TJKM suggests that the project contribute a portion of funding towards improvements to the interchange relative to its fair share.

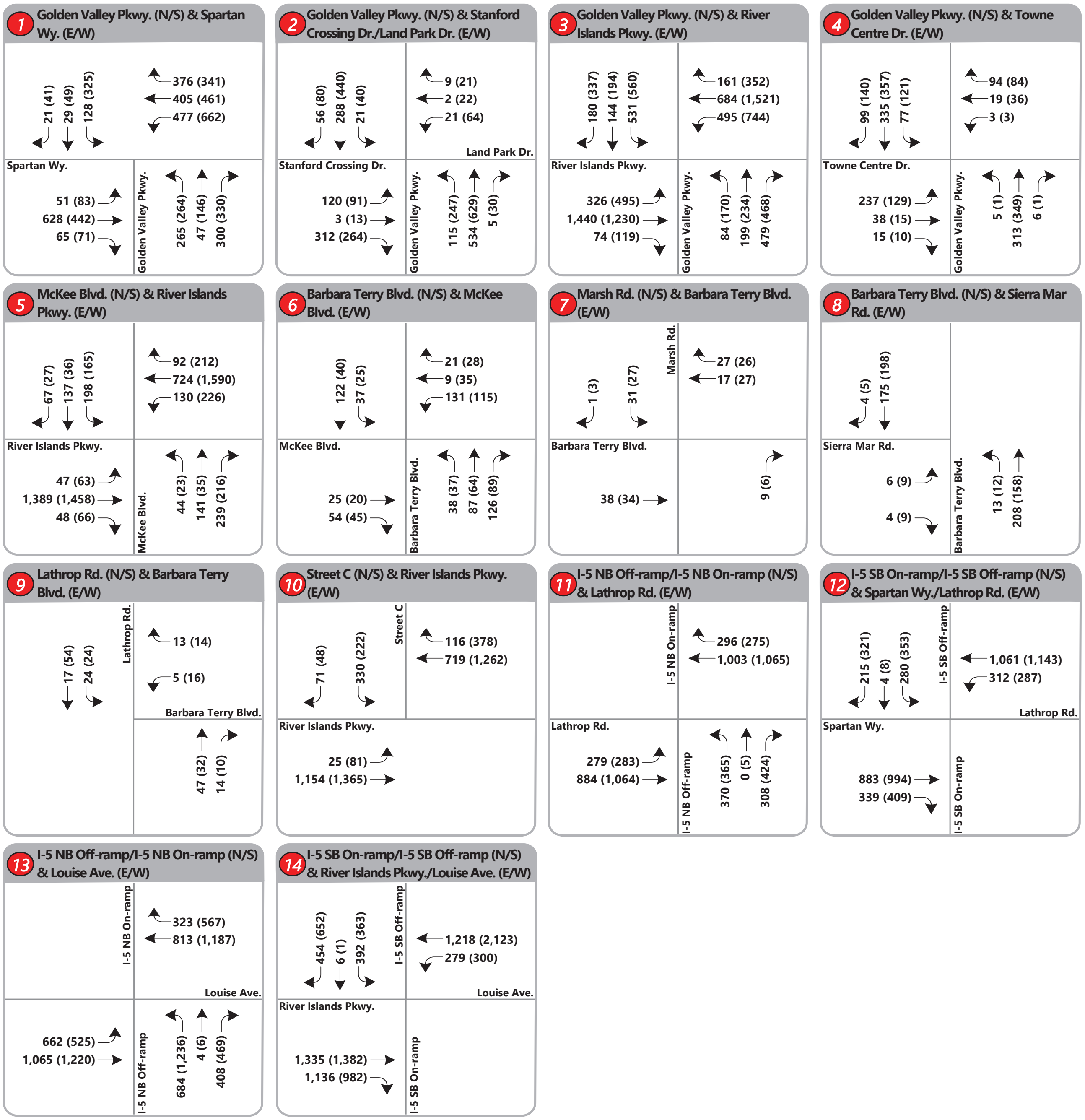
Table 10: Intersection Level of Service – 2026 Baseline plus Project Conditions

No.	Intersection	Intersection Control[1]	Peak Hour[2]	Baseline		Baseline + Project		
				Average Delay[3]	LOS[4]	Average Delay[3]	LOS[4]	Change in Delay[5]
1	Golden Valley Parkway (N/S) & Spartan Way (E/W) *(Mitigation: Adjust signal timings.)*	Signal	a.m. p.m. *a.m.* *p.m.*	52.7 **121.1**	D **F**	**58.6** **136.0** *39.8* ***73.3***	**E** **F** *D* ***E***	+5.9 +14.9 *-12.9* *-47.8*
2	Golden Valley Parkway (N/S) & Stanford Crossing Drive (E/W)	Signal	a.m. p.m.	29.8 42.4	C D	30.7 44.5	C D	+0.9 +2.1
3	Golden Valley Parkway (N/S) & River Islands Parkway (E/W) *(Mitigation: Adjust signal timings; have the NBR and SBR operate under permitted + overlap phasing.)*	Signal	a.m. p.m. *a.m.* *p.m.*	**83.1** **112.8**	**F** **F**	**105.8** **135.8** ***82.0*** ***90.0***	**F** **F** ***F*** ***F***	+22.7 +23.0 *-1.1* *-22.8*
4	Golden Valley Parkway (N/S) & Towne Center Drive (E/W)	Signal	a.m. p.m.	19.7 18.7	B B	19.7 18.7	B B	0.0 0.0
5	River Islands Parkway (N/S) & McKee Boulevard (E/W) *(Mitigation: Adjust signal timings; have the NBR operate under permitted + overlap phasing.)*	Signal	a.m. p.m. *a.m.* *p.m.*	49.6 48.9	D D	**61.3** **74.1** *51.8* *54.7*	**E** **E** *D* *D*	+11.7 +25.2 *+2.2* *+5.8*
6	Barbara Terry Boulevard (E/W) & McKee Boulevard (N/S)	AWSC	a.m. p.m.	13.8 10.0	B A	14.6 10.8	B B	+0.8 +0.8
7	Barbara Terry Boulevard (E/W) & Marsh Road (N/S)	OWSC (Existing) / TWSC (Future)	a.m. p.m.	9.2 9.0	A A	9.5 9.6	A A	+0.3 +0.6
8	Barbara Terry Boulevard (N/S) & Sierra Mar Road (E/W)	OWSC	a.m. p.m.	11.9 11.6	B B	12.3 12.2	B B	+0.4 +0.6
9	Barbara Terry Boulevard (E/W) & Towne Centre Drive (N/S)	OWSC (Future)	a.m. p.m.	- -	- -	8.8 9.0	A A	- -
10	River Islands Parkway (E/W) & Street C (N/S) *(Mitigation: Install traffic signal; install SBR and EBL turn lanes.)*	OWSC (Future) *MIT: Signal*	a.m. p.m. *a.m.* *p.m.*	- -	- -	**917.0** **21,000.7** *10.9* *12.9*	**F** **F** *B* *B*	- - - -
11	Spartan Way / Lathrop Road (E/W) & I-5 NB Ramps (N/S) *(Mitigation: Adjust signal timings.)*	Signal	a.m. p.m. *a.m.* *p.m.*	**116.6** **145.9**	**F** **F**	**124.2** **151.4** ***116.1*** ***144.6***	**F** **F** ***F*** ***F***	+7.6 +5.5 *-0.5* *-1.3*
12	Spartan Way / Lathrop Road (E/W) & I-5 SB Ramps (N/S) *(Mitigation: Adjust signal timings.)*	Signal	a.m. p.m. *a.m.* *p.m.*	**72.6** **109.0**	**E** **F**	**84.8** **128.1** ***66.3*** ***113.7***	**F** **F** ***E*** ***F***	+12.2 +19.1 *-6.3* *+4.7*
13	River Islands Parkway / Louise Avenue (E/W) & I-5 NB Ramps (N/S)	Signal	a.m. p.m.	**91.5** **161.7**	**F** **F**	**131.6** **221.3**	**F** **F**	+40.1 +59.6
14	River Islands Parkway / Louise Avenue (E/W) & I-5 SB Ramps (N/S) *(Mitigation: Adjust signal timings.)*	Signal	a.m. p.m. *a.m.* *p.m.*	**227.4** **368.6**	**F** **F**	**309.8** **460.7** ***160.9*** ***290.2***	**F** **F** ***F*** ***F***	+82.4 +92.1 *-66.5* *-78.4*

Notes:

1. Signal = Signalized; OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; AWSC = All-Way Stop Control
2. a.m. = a.m. peak hour; p.m. = p.m. peak hour
3. Delay measured in seconds per vehicle. For signalized and all-way stop controlled intersections, the delay represents the average control delay for all turning movements. For one- and two-way stop controlled intersections, the delay represents the worse average control delay for a given approach.
4. LOS = Level of Service; "-"= no data; not included in scenario

Figure 10: 2026 Baseline Conditions plus Project - Intersection Peak Hour Traffic Volumes



LEGEND

XX AM Peak Hour Volumes
(XX) PM Peak Hour Volumes

TJKM

7.0 2040 CUMULATIVE CONDITIONS

This section presents the results of the level of service calculations under Cumulative Conditions without the project. Level of service analyses at the study intersections were conducted for Cumulative Conditions to evaluate the impacts due to the addition of traffic from the proposed projects and additional regional growth.

7.1 Intersection Level of Service Analysis – Cumulative Conditions

The 2040 Cumulative volumes for the study intersections are based on the 2026 traffic volumes from the 2022 Traffic Monitoring Program for The City of Lathrop (TMP) and were grown to 2040 conditions by assuming a 2.0 percent per year growth rate to account for increases in traffic demand. The growth in intersection peak hour traffic volumes due to regional growth around the proposed project is shown in **Figure 11**.

Figure 12 displays projected peak hour turning movement volumes at all of the study intersections for the Cumulative Conditions scenario. Excerpts from the TMP are provided in **Appendix B**.

The intersection LOS analysis results for Cumulative Conditions are summarized in **Table 11**. Intersections that operated at LOS E or F are shown in red. Detailed calculation sheets for Cumulative Conditions are contained in **Appendix H**.

Under this scenario, five of the 12 existing study intersections are expected to continue to operate at an acceptable service levels (LOS D or better) during the a.m. and p.m. peak hours.

The following intersections are projected to operate at unacceptable level of service:

- Golden Valley Parkway and Spartan Way (Intersection 1) operates at LOS E during the a.m. peak hour and LOS F during the p.m. peak hour.
- Golden Valley Parkway and River Islands Parkway (Intersection 3) operates at LOS F during both peak hours.
- Golden Valley Parkway and McKee Boulevard (Intersection 5) operates at LOS E during the p.m. peak hour.
- Spartan Way / Lathrop Road and the I-5 ramps (Intersections 11 & 12) operate at LOS F during both peak hours.
- River Island Parkway / Louise Avenue and the I-5 ramps (Intersections 13 & 14) operate at LOS F during both peak hours.

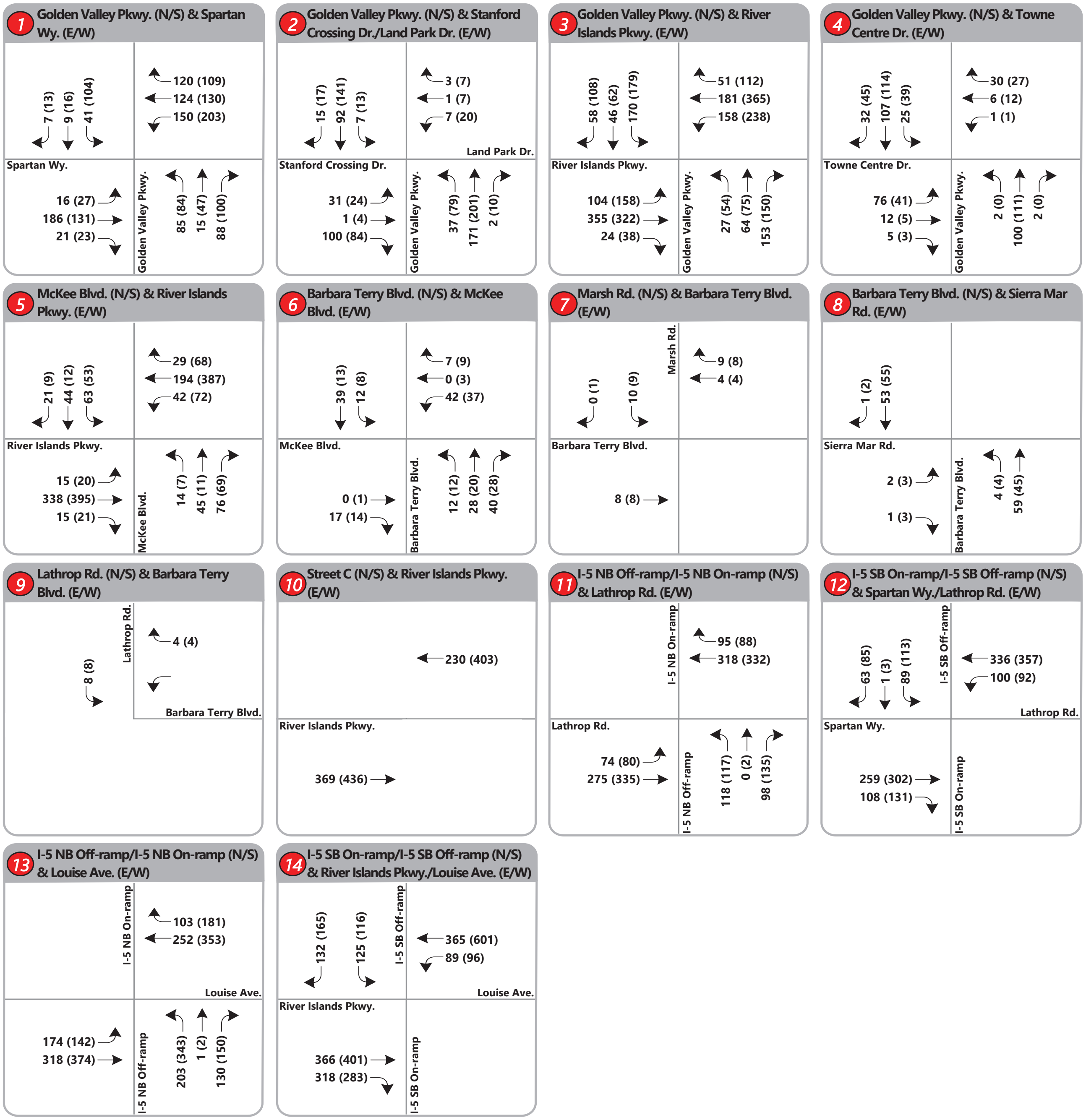
Table 11: Intersection Level of Service – 2040 Cumulative Conditions

No.	Intersection	Intersection Control[1]	Peak Hour[2]	Average Delay[3]	LOS[4]
1	Golden Valley Parkway (N/S) & Spartan Way (E/W)	Signal	AM PM	**70.8** **176.8**	**E** **F**
2	Golden Valley Parkway (N/S) & Stanford Crossing Drive (E/W)	Signal	AM PM	23.2 31.0	C C
3	Golden Valley Parkway (N/S) & River Islands Parkway (E/W)	Signal	AM PM	**86.0** **132.5**	**F** **F**
4	Golden Valley Parkway (N/S) & Towne Center Drive (E/W)	Signal	AM PM	20.2 17.5	C B
5	River Islands Parkway (N/S) & McKee Boulevard (E/W)	Signal	AM PM	47.7 **68.2**	D **E**
6	Barbara Terry Boulevard (E/W) & McKee Boulevard (N/S)	AWSC	AM PM	10.8 9.2	B A
7	Barbara Terry Boulevard (E/W) & Marsh Road (N/S)	OWSC	AM PM	9.0 9.0	A A
8	Barbara Terry Boulevard (N/S) & Sierra Mar Road (E/W)	OWSC	AM PM	11.1 10.6	B B
9	Barbara Terry Boulevard (E/W) & Towne Centre Drive (N/S)	Future Intersection	AM PM	- -	- -
10	River Islands Parkway (E/W) & Street C (N/S)	Future Intersection	AM PM	- -	- -
11	Spartan Way / Lathrop Road (E/W) & I-5 NB Ramps (N/S)	Signal	AM PM	**172.6** **204.9**	**F** **F**
12	Spartan Way / Lathrop Road (E/W) & I-5 SB Ramps (N/S)	Signal	AM PM	**107.2** **152.3**	**F** **F**
13	River Islands Parkway / Louise Avenue (E/W) & I-5 NB Ramps (N/S)	Signal	AM PM	**144.4** **272.0**	**F** **F**
14	River Islands Parkway / Louise Avenue (E/W) & I-5 SB Ramps (N/S)	Signal	AM PM	**365.8** **550.9**	**F** **F**

Notes:

1. Signal = Signalized; OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; AWSC = All-Way Stop Control
2. a.m. = a.m. peak hour; p.m. = p.m. peak hour
3. Delay measured in seconds per vehicle. For signalized and all-way stop controlled intersections, the delay represents the average control delay for all turning movements. For one- and two-way stop controlled intersections, the delay represents the worse average control delay for a given approach.
4. LOS = Level of Service; "-"= no data; not included in scenario

Figure 11: Inherent Regional Growth Volumes (2026 to 2040)



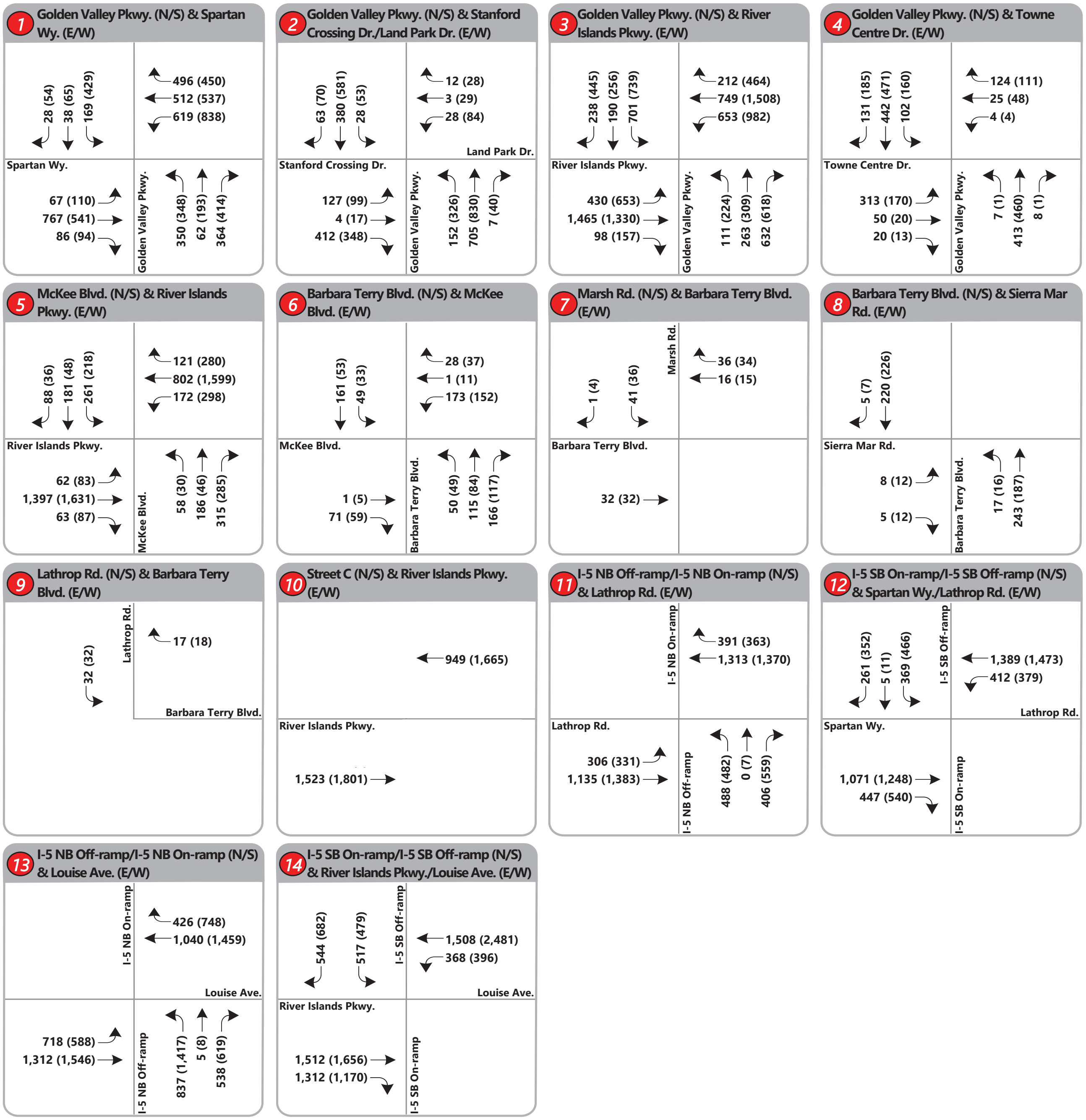
LEGEND

XX AM Peak Hour Volumes

(XX) PM Peak Hour Volumes

N

Figure 12: 2040 Cumulative Conditions - Intersection Peak Hour Traffic Volumes



LEGEND

XX AM Peak Hour Volumes

(XX) PM Peak Hour Volumes

N

8.0 2040 CUMULATIVE CONDITIONS PLUS PROJECT

This section describes the operational impacts of the proposed project on the transportation system in the immediate project site vicinity. Cumulative Conditions plus Project consist of cumulative traffic volumes and roadway facilities plus new traffic generated by the proposed project.

8.1 Intersection Level of Service Analysis – Cumulative Conditions plus Project

The intersection level of service analysis results for the Cumulative Conditions plus Project scenario are summarized in **Table 12**. The results for Cumulative Conditions are included for comparison purposes. Detailed calculation sheets for Cumulative Conditions plus Project scenario are contained in **Appendix I**.

Figure 13 displays projected peak hour turning movement volumes at all of the study intersections for Cumulative Conditions plus Project scenario.

Under this scenario, six of the 14 study intersections are expected to continue to operate at an acceptable service levels (LOS D or better) during the a.m. and p.m. peak hours (similar to without project conditions).

The following seven intersections would require mitigations in order to account for additional demand due to the proposed development:

- Golden Valley Parkway and Spartan Way (Intersection 1) would continue to operate at LOS E during the a.m. peak hour and at LOS F during the p.m. peak hour. Delays would increase by 1.3 seconds per vehicle during the a.m. peak hour and by 7.3 seconds per vehicle during the p.m. peak hour.
    - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the signal is anticipated to operate with substantially less delay during both peak hours as compared to Cumulative Conditions.
- Golden Valley Parkway and River Islands Parkway (Intersection 3) continues to operate at LOS F during both peak hours and would experience increases in delay of 27.5 seconds per vehicle during the a.m. peak hour and 31.3 seconds per vehicle during the p.m. peak hour.
    - It is recommended that the signal timings of the intersection be changed slightly[1] and the northbound right and southbound right turning movements operate with overlap phases. With these changes, the intersection would operate with less delay than under Cumulative Conditions.
- River Islands Parkway and McKee Boulevard (Intersection 5) degrades from LOS D to LOS E during the a.m. peak hour and degrades from LOS E to LOS F during the p.m. peak hour.
    - It is recommended that the signal timings of the intersection be changed slightly[1] and that the northbound right turning movement operate with an overlap. With these changes, the intersection would operate better than Cumulative Conditions.
- River Islands Parkway and Street C (Intersection 10) operates at LOS F under one-way stop control.

  - It is recommended that the intersection be signalized and that a southbound right turn lane and an eastbound left turn lane be added. With these improvements, the intersection is projected to operate overall at LOS B during both peak hours.
- Spartan Way / Lathrop Road at I-5 NB Ramps (Intersection 11) continues to operate at LOS F during both peak hours and would experience an increase in delay of 4.5 seconds per vehicle during both peak hours.
  - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate with slightly less vehicular delay than under Cumulative Conditions.
- Spartan Way / Lathrop Road at I-5 SB Ramps (Intersection 12) continues to operate at LOS F during the a.m. and p.m. peak hours. The intersection would experience an increase in delay of 4.1 seconds per vehicle during the a.m. peak hour and 16.3 seconds per vehicle during the p.m. peak hour.
  - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate similarly to Cumulative Conditions.
- River Island Parkway / Louise Avenue at I-5 SB Ramps (Intersection 14) continues to operate at LOS F during both peak hours and would experience an increase in delay of 88.6 seconds per vehicle during the a.m. peak hour and 85.4 seconds per vehicle during the p.m. peak hour.
  - It is recommended that the signal timings of the intersection be changed slightly[1]. With these changes, the intersection would operate with less vehicular delay than compared to Cumulative Conditions during both peak hours. It should be noted, however, that the intersection would continue to operate with hundreds of seconds of delay.
  - To improve operations, physical modifications to the interchange ramp would be necessary. The City is currently assessing potential improvements to the interchange ramps. It is expected that with geometric improvements, delays at the intersection would substantially decrease.

The following intersection would experience **significant and unavoidable inconsistencies** with City standards due to additional traffic generated by the proposed development:

- River Island Parkway / Louise Avenue at I-5 NB Ramps (Intersection 13) continues to operate at LOS F during both peak hours. With the additional site generated traffic, the intersection experiences an increase in delay by 40.2 seconds per vehicle during the a.m. peak hour and 60.1 seconds per vehicle during the p.m. peak hour.
  - To improve conditions, physical modifications to the interchange ramp would be necessary. The City is currently assessing potential improvements to the interchange ramps. It is expected that with geometric improvements, delays at the intersection would substantially decrease.

- Of note, the City's General Plan (2022) states an exception to the LOS D standard "where constructing facilities with sufficient capacity would be unreasonably expensive." TJKM suggests that the project contribute a portion of funding towards improvements to the interchange relative to its fair share.

Table 12: Intersection Level of Service – 2040 Cumulative Conditions plus Project

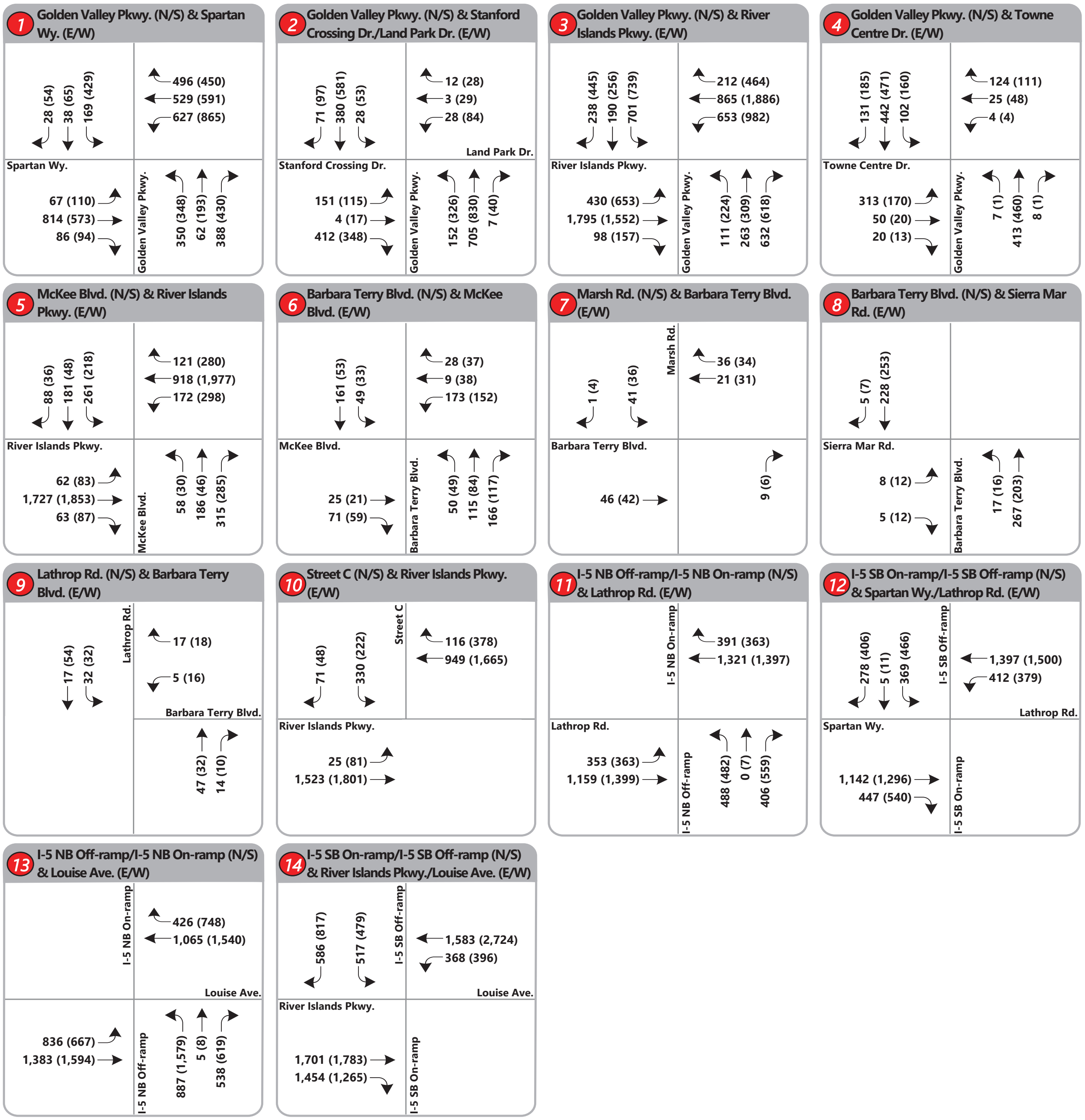
No.	Intersection	Intersection Control[1]	Peak Hour[2]	Cumulative Average Delay[3]	Cumulative LOS[4]	Cumulative + Project Average Delay[3]	Cumulative + Project LOS[4]	Cumulative + Project Change in Delay[5]
1	Golden Valley Parkway (N/S) & Spartan Way (E/W)	Signal	AM	**70.8**	**E**	**72.1**	**E**	+1.3
			PM	**176.8**	**F**	**184.1**	**F**	+7.3
	(Mitigation: Adjust signal timings.)		*AM*			*39.4*	*D*	*-31.4*
			PM			***96.8***	***F***	*-80.0*
2	Golden Valley Parkway (N/S) & Stanford Crossing Drive (E/W)	Signal	AM	23.2	C	23.5	C	+0.3
			PM	31.0	C	31.6	C	+0.6
3	Golden Valley Parkway (N/S) & River Islands Parkway (E/W)	Signal	AM	**86.0**	**F**	**113.5**	**F**	+27.5
			PM	**132.5**	**F**	**163.8**	**F**	+31.3
	(Mitigation: Adjust signal timings; have the NBR and SBR operate under permitted + overlap phasing.)		*AM*			***83.4***	***F***	*-2.6*
			PM			***84.1***	***F***	*-48.4*
4	Golden Valley Parkway (N/S) & Towne Center Drive (E/W)	Signal	AM	20.2	C	20.2	C	0.0
			PM	17.5	B	17.5	B	0.0
5	River Islands Parkway (N/S) & McKee Boulevard (E/W)	Signal	AM	47.7	D	**57.4**	**E**	+9.7
			PM	**68.2**	**E**	**112.2**	**F**	+44.0
	(Mitigation: Adjust signal timings; have the NBR operate under permitted + overlap phasing.)		*AM*			*40.6*	*D*	*-7.1*
			PM			***63.7***	***E***	*-4.5*
6	Barbara Terry Boulevard (E/W) & McKee Boulevard (N/S)	AWSC	AM	10.8	B	11.1	B	+0.3
			PM	9.2	A	9.5	A	+0.3
7	Barbara Terry Boulevard (E/W) & Marsh Road (N/S)	OWSC (Existing) / TWSC (Future)	AM	9.0	A	9.3	A	+0.3
			PM	9.0	A	9.4	A	+0.4
8	Barbara Terry Boulevard (N/S) & Sierra Mar Road (E/W)	OWSC	AM	11.1	B	11.3	B	+0.2
			PM	10.6	B	10.9	B	+0.3
9	Barbara Terry Boulevard (E/W) & Towne Centre Drive (N/S)	OWSC (Future)	AM	-	-	8.8	A	-
			PM	-	-	9.1	A	-
10	River Islands Parkway (E/W) & Street C (N/S)	OWSC (Future)	AM	-	-	**2,590.4**	**F**	-
			PM	-	-	**8,753.5**	**F**	-
	(Mitigation: Install traffic signal; install SBR and EBL turn lanes.)	*MIT: Signal*	*AM*			*12.2*	*B*	-
			PM			*18.9*	*B*	-
11	Spartan Way / Lathrop Road (E/W) & I-5 NB Ramps (N/S)	Signal	AM	**172.6**	**F**	**177.1**	**F**	+4.5
			PM	**204.9**	**F**	**209.4**	**F**	+4.5
	(Mitigation: Adjust signal timings)		*AM*			***160.5***	***F***	*-12.1*
			PM			***194.5***	***F***	*-10.4*
12	Spartan Way / Lathrop Road (E/W) & I-5 SB Ramps (N/S)	Signal	AM	**107.2**	**F**	**111.3**	**F**	+4.1
			PM	**152.3**	**F**	**168.6**	**F**	+16.3
	(Mitigation: Adjust signal timings)		*AM*			***107.1***	***F***	*-0.1*
			PM			***155.3***	***F***	*+3.0*
13	River Islands Parkway / Louise Avenue (E/W) & I-5 NB Ramps (N/S)	Signal	AM	**144.4**	**F**	**184.6**	**F**	+40.2
			PM	**272.0**	**F**	**332.1**	**F**	+60.1
14	River Islands Parkway / Louise Avenue (E/W) & I-5 SB Ramps (N/S)	Signal	AM	**365.8**	**F**	**454.4**	**F**	+88.6
			PM	**550.9**	**F**	**636.3**	**F**	+85.4
			AM			***266.9***	***F***	*-98.9*

No.	**Intersection**	**Intersection Control[1]**	**Peak Hour[2]**	**Cumulative**		**Cumulative + Project**		
				Average Delay[3]	**LOS[4]**	**Average Delay[3]**	**LOS[4]**	**Change in Delay[5]**
	(Mitigation: Adjust signal timings.)		*PM*			***415.3***	***F***	*-135.6*

Notes:

1. Signal = Signalized; OWSC = One-Way Stop Control; TWSC = Two-Way Stop Control; AWSC = All-Way Stop Control
2. a.m. = a.m. peak hour; p.m. = p.m. peak hour
3. Delay measured in seconds per vehicle. For signalized and all-way stop controlled intersections, the delay represents the average control delay for all turning movements. For one- and two-way stop controlled intersections, the delay represents the worse average control delay for a given approach.
4. LOS = Level of Service; "-"= no data; not included in scenario

Figure 13: 2040 Cumulative Conditions plus Project - Intersection Peak Hour Traffic Volumes



LEGEND

XX AM Peak Hour Volumes

(XX) PM Peak Hour Volumes

N

8.2 Fair Share Analysis

The City of Lathrop is in the process of planning improvements to the River Islands Parkway/I-5 interchange (Intersections 13 & 14).

A fair share analysis was conducted for the interchange. "Fair Share" is defined as the percent contribution of project traffic to the growth from Existing Conditions to Cumulative plus Project Conditions. **Table 13** shows the fair share for a.m. and p.m. peak hour volumes at the two study intersections. The average fair share for the commuter peak hours is approximately 10.26 percent.

TJKM suggests that the Mossdale West project be expected to fund its fair share of the interchange project costs by payment of local and regional development fees, consistent with the City of Lathrop's General Plan policies and the City's efforts to achieve an acceptable level of service.

Table 13: Fair Share Analysis

No.	Intersection	Peak Hour	Existing Volume	Project Trips	Cumulative + Project Trips	Cumulative Growth	Fair Share Percent
			A	B	C	D = C-A	E = B/D
13	River Island Pkwy (E/W) at I-5 NB Ramps (N/S)	a.m.	2,102	264	5,140	3,038	8.69%
		p.m.	2,693	370	6,755	4,062	9.11%
		Total	**4,795**	**634**	**11,895**	**7,100**	**8.93%**
14	River Island Pkwy (E/W) at I-5 SB Ramps (N/S)	a.m.	2,080	448	6,209	4,129	10.85%
		p.m.	2,297	600	7,464	5,167	11.61%
		Total	**4,377**	**1,048**	**13,673**	**9,296**	**11.27%**
		Total	**9,172**	**1,682**	**25,568**	**16,396**	**10.26%**

9.0 ADDITIONAL ANALYSES

The following sections provide additional analyses of other transportation issues associated with the project site, including:

- Site Access & Onsite Circulation
- Parking
- Pedestrian, Bicycle, and Transit Impacts

9.1 Site Access & On-Site Circulation

The project would be accessed by one intersection on River Island Parkway and two intersections on Barbara Terry Boulevard. All driveways will be full access. Any proposed landscaping should be maintained to provide adequate sight distance. The proposed driveway locations, designs, and sight distances are expected to all be ***adequate***. The site plan shows all proposed pedestrian facilities on the project frontage and connectivity from River Island Parkway.

9.2 Parking

Based on City of Lathrop parking requirements (Section 17 of the City's Municipal Code), one-family dwelling units shall have garages that can accommodate two spaces (Section 17.76.020.C.1.a). Additionally, at least one on-street parking shall be provided for each single-family resident within any residential zoning district (Section 17.76.030.I). The site is anticipated to conform to City standards. Thus, site parking is expected to be ***adequate***.

9.3 Pedestrian, Bicycle, and Transit Impacts

Pedestrian Impacts

Pedestrian access to the project site is facilitated by concrete sidewalks and marked crosswalks along River Island Parkway and Barbara Terry Boulevard. Based on current plans all street internal to the site will contain five-foot sidewalks or 15-foot trail (Street A). The proposed development project does not conflict with existing and planned pedestrian facilities; therefore, the impact to pedestrian facilities is ***less-than-significant***.

Bicycle Impacts

There is an existing Type II bicycle facility on River Island Parkway near the project vicinity. The project does not conflict with existing and planned bicycle facilities; therefore, the impact to bicycle facilities is ***less-than-significant***.

Transit Impacts

The project site is within a 1.5 mile of two San Joaquin RTD bus stops, located on the northwest corner of E Louis Avenue/Harlan Road Intersection. Impacts to transit service are expected to be ***less-than-significant.***

Appendix A – Level of Service Methodology

APPENDIX A
LEVEL OF SERVICE

The description and procedures for calculating capacity and level of service (LOS) are found in Transportation Research Board, *Highway Capacity Manual 2000*. *Highway Capacity Manual 2000* represents the latest research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. LOS is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish service levels.

A general description of service levels for various types of facilities is shown in Table A-I

Table A-I: Level of Service Description

	Uninterrupted Flow	***Interrupted Flow***
Facility Type	Freeways Multi-lane Highways Two-lane Highways Urban Streets	Signalized Intersections Unsignalized Intersections Two-way Stop Control All-way Stop Control
LOS		
A	Free-flow	Very low delay.
B	Stable flow. Presence of other users noticeable.	Low delay.
C	Stable flow. Comfort and convenience starts to decline.	Acceptable delay.
D	High-density stable flow.	Tolerable delay.
E	Unstable flow.	Limit of acceptable delay.
F	Forced or breakdown flow.	Unacceptable delay

Source: *Highway Capacity Manual 2000*

Urban Streets

The term "urban streets" refers to urban arterials and collectors, including those in downtown areas.

Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials.
Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals.

Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks.

Pedestrian conflicts and lane obstructions created by stopping or standing buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control. As a result, these factors also affect quality of service.

The street environment includes the geometric characteristics of the facility, the character of roadside activity and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway density, spacing between signalized intersections, existence of parking, level of pedestrian activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic control (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds, however, such controls are needed to establish right-of-way.

The average travel speed for through vehicles along an urban street is the determinant of the operating LOS. The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

LOS A describes primarily free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal.

LOS B describes reasonably unimpeded operations. The ability to maneuver within the traffic stream is only slightly restricted, and control delays at signalized intersections are not significant.

LOS C describes stable operations, however, ability to maneuver and change lanes in midblock location may be more restricted than at LOS B. Longer queues, adverse signal coordination, or both may contribute to lower travel speeds.

LOS D borders on a range in which in which small increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or a combination of these factors.

LOS E is characterized by significant delays and lower travel speeds. Such operations are caused by a combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

LOS F is characterized by urban street flow at extremely low speeds. Intersection congestion is likely at critical signalized locations, with high delays, high volumes, and extensive queuing.

The methodology to determine LOS stratifies urban streets into four classifications. The classifications are complex, and are related to functional and design categories. Table A-II describes the functional and design categories, while Table A-III relates these to the urban street classification.

Once classified, the urban street is divided into segments for analysis. An urban street segment is a one-way section of street encompassing a series of blocks or links terminating at a signalized intersection. Adjacent segments of urban streets may be combined to form larger street sections, provided that the segments have similar demand flows and characteristics.

Levels of service are related to the average travel speed of vehicles along the urban street segment or section.

Travel times for existing conditions are obtained by field measurements. The maximum-car technique is used. The vehicle is driven at the posted speed limit unless impeded by actual traffic conditions. In the maximum-car technique, a safe level of vehicular operation is maintained by observing proper following distances and by changing speeds at reasonable rates of acceleration and deceleration. The maximum-car technique provides the best base for measuring traffic performance.

An observer records the travel time and locations and duration of delay. The beginning and ending points are the centers of intersections. Delays include times waiting in queues at signalized intersections. The travel speed is determined by dividing the length of the segment by the travel time. Once the travel speed on the arterial is determined, the LOS is found by comparing the speed to the criteria in Table A-IV. LOS criteria vary for the different classifications of urban street, reflecting differences in driver expectations.

Table A-II: Functional and Design Categories for Urban Streets

Criterion	***Functional Category***			
	Principal Arterial		***Minor Arterial***	
Mobility function	Very important		Important	
Access function	Very minor		Substantial	
Points connected	Freeways, important activity centers, major traffic generators		Principal arterials	
Predominant trips served	Relatively long trips between major points and through trips entering, leaving, and passing through city		Trips of moderate length within relatively small geographical areas	
Criterion	***Design Category***			
	High-Speed	***Suburban***	***Intermediate***	***Urban***
Driveway access density	Very low density	Low density	Moderate density	High density
Arterial type	Multilane divided; undivided or two-lane with shoulders	Multilane divided: undivided or two-lane with shoulders	Multilane divided or undivided; one way, two lane	Undivided one way; two way, two or more lanes
Parking	No	No	Some	Usually
Separate left-turn lanes	Yes	Yes	Usually	Some
Signals per mile	0.5 to 2	1 to 5	4 to 10	6 to 12
Speed limits	45 to 55 mph	40 to 45 mph	30 to 40 mph	25 to 35 mph
Pedestrian activity	Very little	Little	Some	Usually
Roadside development	Low density	Low to medium density	Medium to moderate density	High density

Source: *Highway Capacity Manual 2000*

Table A-III: Urban Street Class based on Function and Design Categories

Design Category	*Functional Category*	
	Principal Arterial	*Minor Arterial*
High-Speed	I	Not applicable
Suburban	II	II
Intermediate	II	III or IV
Urban	III or IV	IV

Source: *Highway Capacity Manual 2000*

Table A-IV: Urban Street Levels of Service by Class

Urban Street Class	*I*	*II*	*III*	*IV*
Range of Free Flow Speeds (mph)	45 to 55	35 to 45	30 to 35	25 to 35
Typical Free Flow Speed (mph)	50	40	33	30
LOS	*Average Travel Speed (mph)*			
A	>42	>35	>30	>25
B	>34	>28	>24	>19
C	>27	>22	>18	>13
D	>21	>17	>14	>9
E	>16	>13	>10	>7
F	≤16	≤13	≤10	≤7

Source: *Highway Capacity Manual 2000*

Interrupted Flow

One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs. These all operate quite differently and have differing impacts on overall flow.

Signalized Intersections

The capacity of a highway is related primarily to the geometric characteristics of the facility, as well as to the composition of the traffic stream on the facility. Geometrics are a fixed, or non-varying, characteristic of a facility.

At the signalized intersection, an additional element is introduced into the concept of capacity: time allocation. A traffic signal essentially allocates time among conflicting traffic movements seeking use of the same physical space. The way in which time is allocated has a significant impact on the operation of the intersection and on the capacity of the intersection and its approaches.

LOS for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, LOS criteria for traffic signals are stated in terms of average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the ratio of green time to cycle length and the volume to capacity ratio for the lane group.

For each intersection analyzed the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A LOS designation is given to the control delay to better describe the level of operation. A description of levels of service for signalized intersections can be found in Table A-V

Table A-V: Description of Level of Service for Signalized Intersections

LOS	*Description*
A	Very low control delay, up to 10 seconds per vehicle. Progression is extremely favorable, and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	Control delay greater than 10 and up to 20 seconds per vehicle. There is good progression or short cycle lengths or both. More vehicles stop causing higher levels of delay.
C	Control delay greater than 20 and up to 35 seconds per vehicle. Higher delays are caused by fair progression or longer cycle lengths or both. Individual cycle failures may begin to appear. Cycle failure occurs when a given green phase doe not serve queued vehicles, and overflow occurs. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle. The influence of congestions becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volumes. Many vehicles stop, the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle. The limit of acceptable delay. High delays usually indicate poor progression, long cycle lengths, and high volumes. Individual cycle failures are frequent.
F	Control delay in excess of 80 seconds per vehicle. Unacceptable to most drivers. Oversaturation, arrival flow rates exceed the capacity of the intersection. Many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to higher delay.

Source: *Highway Capacity Manual 2000*

The use of control delay, which may also be referred to as signal delay, was introduced in the 1997 update to the *Highway Capacity Manual*, and represents a departure from previous updates. In the third edition, published in 1985 and the 1994 update to the third edition, delay only included stopped delay. Thus, the LOS criteria listed in Table A-V differs from earlier criteria.

Unsignalized Intersections

The current procedures on unsignalized intersections were first introduced in the 1997 update to the *Highway Capacity Manual* and represent a revision of the methodology published in the 1994 update to the 1985 *Highway Capacity Manual*. The revised procedures use control delay as a measure of effectiveness to determine LOS. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, *i. e.,* in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

Two-Way Stop Controlled Intersections

Two-way stop controlled intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At two-way stop-controlled intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A LOS designation is given to the expected control delay for each minor movement. LOS is not defined for the intersection as a whole. Control delay is the increased time of travel for a vehicle approaching and passing through a stop-controlled intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection. A description of levels of service for two-way stop-controlled intersections is found in Table A-VI.

Table A-VI: Description of Level of Service for Two-Way Stop Controlled Intersections

LOS	***Description***
A	Very low control delay less than 10 seconds per vehicle for each movement subject to delay.
B	Low control delay greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Acceptable control delay greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Tolerable control delay greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Limit of tolerable control delay greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Unacceptable control delay in excess of 50 seconds per vehicle for each movement subject to delay.

Source: *Highway Capacity Manual 2000*

Appendix B – Traffic Monitoring Program Intersection Turning Movement Projections

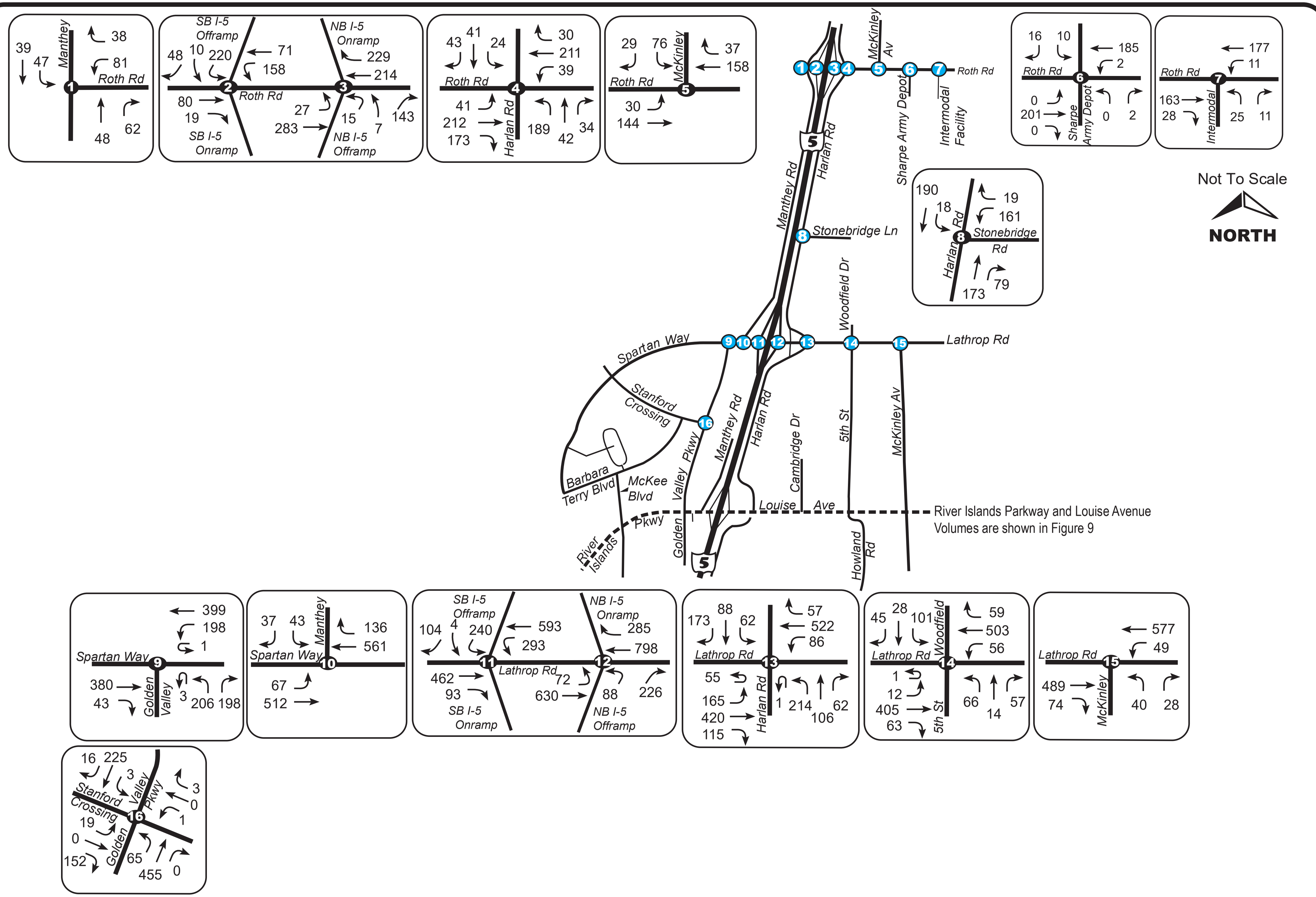
CRANE TRANSPORTATION GROUP

2022 TRAFFIC MONITORING PROGRAM FOR THE CITY OF LATHROP

August 24, 2022

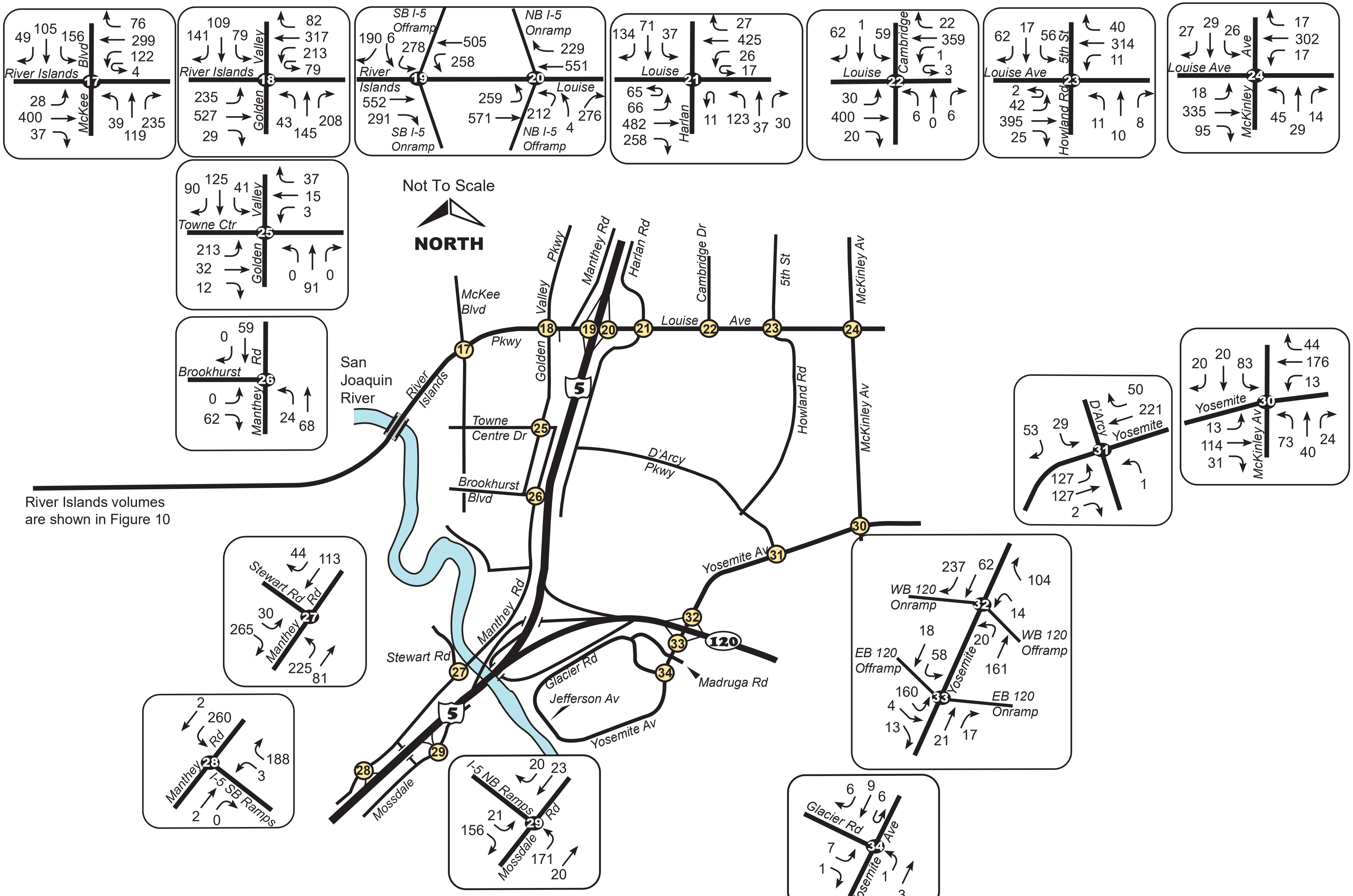
Prepared for: **CITY OF LATHROP**
PUBLIC WORKS DEPARTMENT
Attn: Brad Taylor, P.E., City Engineer
390 Towne Centre Drive
Lathrop, CA 95330
(209) 941-7438
Brad Taylor <btaylor@ci.lathrop.ca.us>

Prepared by: **CRANE TRANSPORTATION GROUP**
Mark D. Crane, P.E., President
California Registered Traffic Engineer (#1381)
2621 East Windrim Court
Elk Grove, CA 95758
(916) 647-3406
Mark Crane <cranetransgroup@gmail.com>



CRANE TRANSPORTATION GROUP

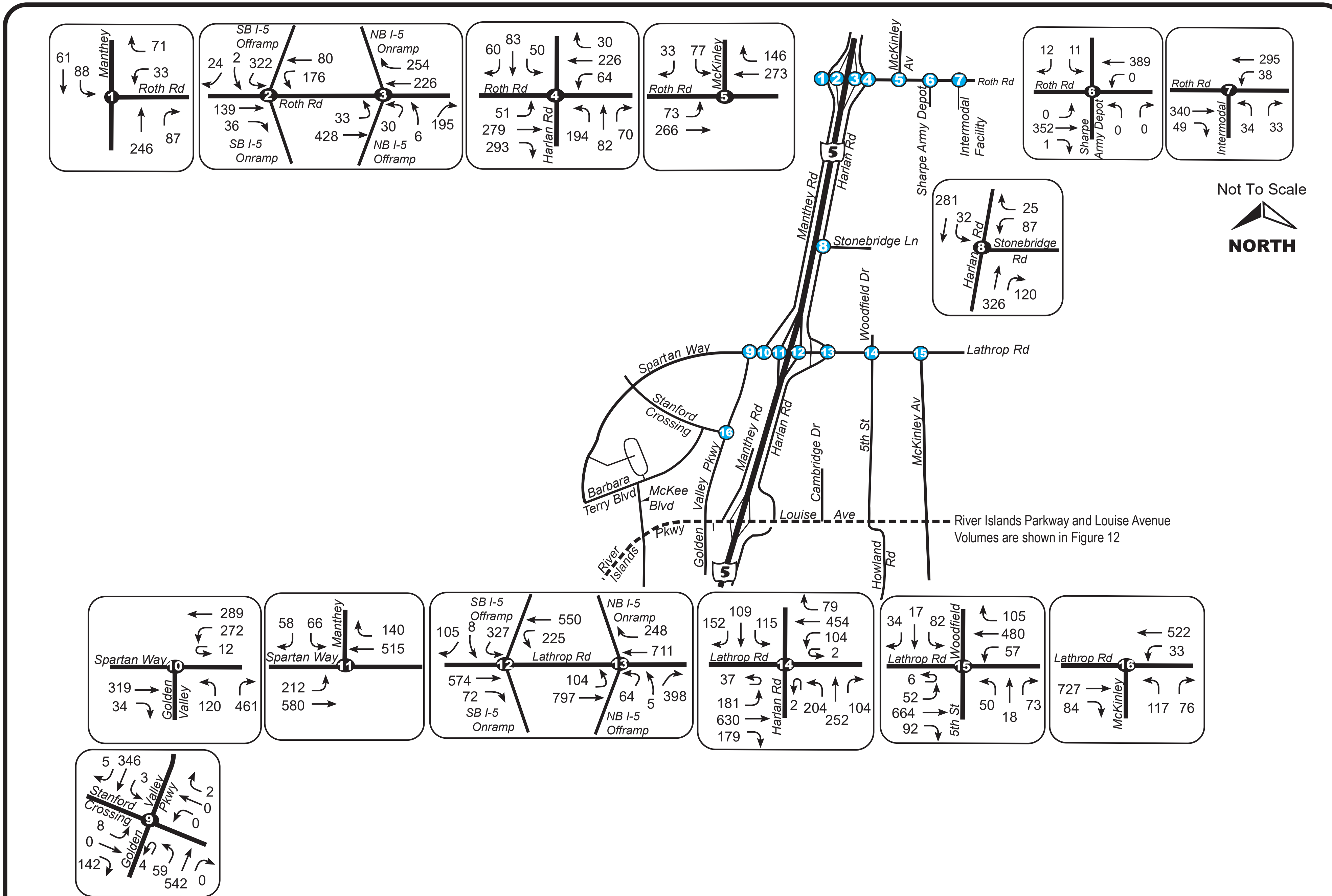
Figure 8
Existing (Year 2022) AM Peak Hour Volumes
Northern Lathrop



2022 Traffic Monitoring Program (TMP) for the City of Lathrop

CRANE TRANSPORTATION GROUP

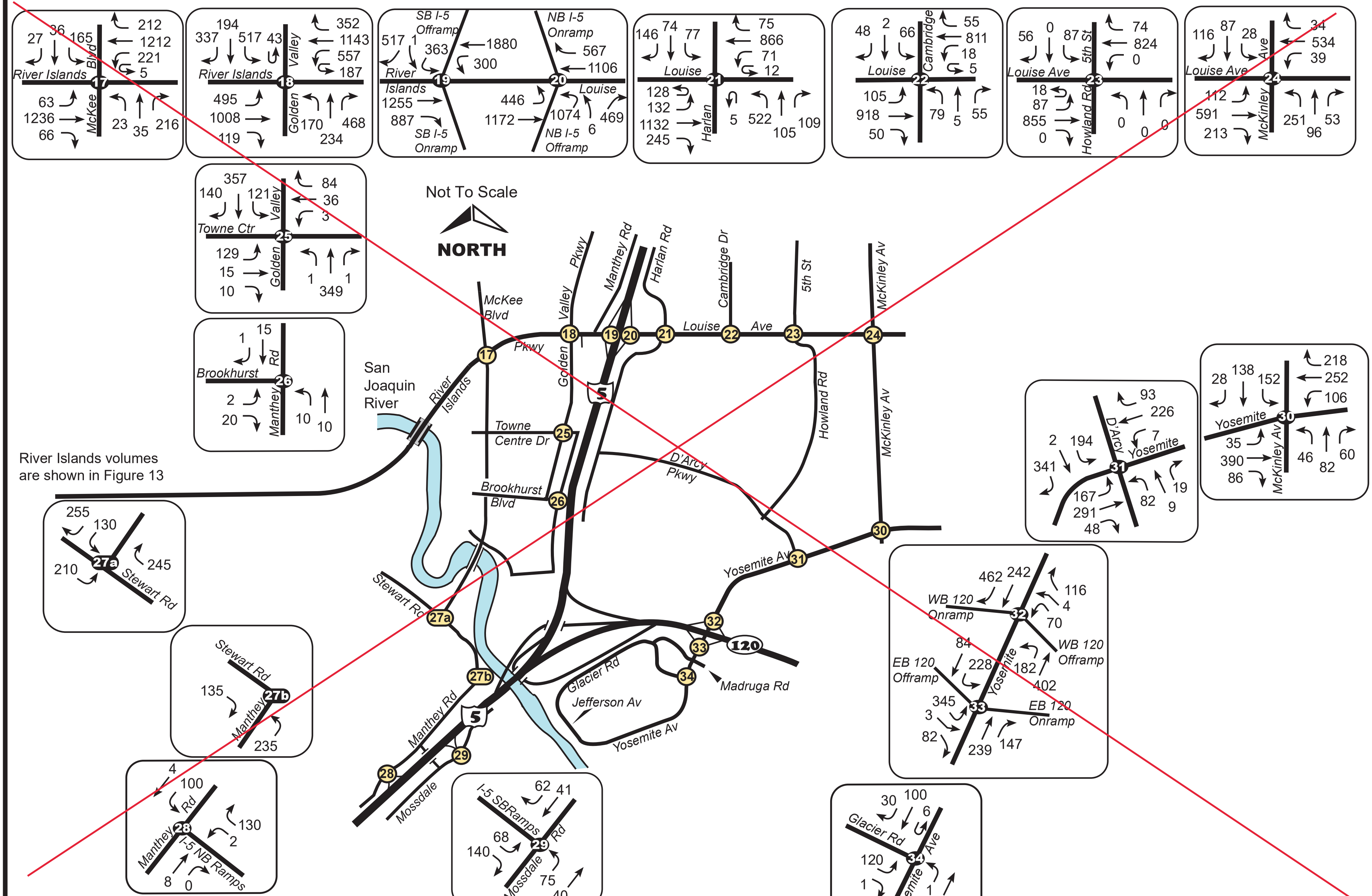
Figure 9
Existing (Year 2022) AM Peak Hour Volumes
Southern Lathrop



2022 Traffic Monitoring Program (TMP) for the City of Lathrop

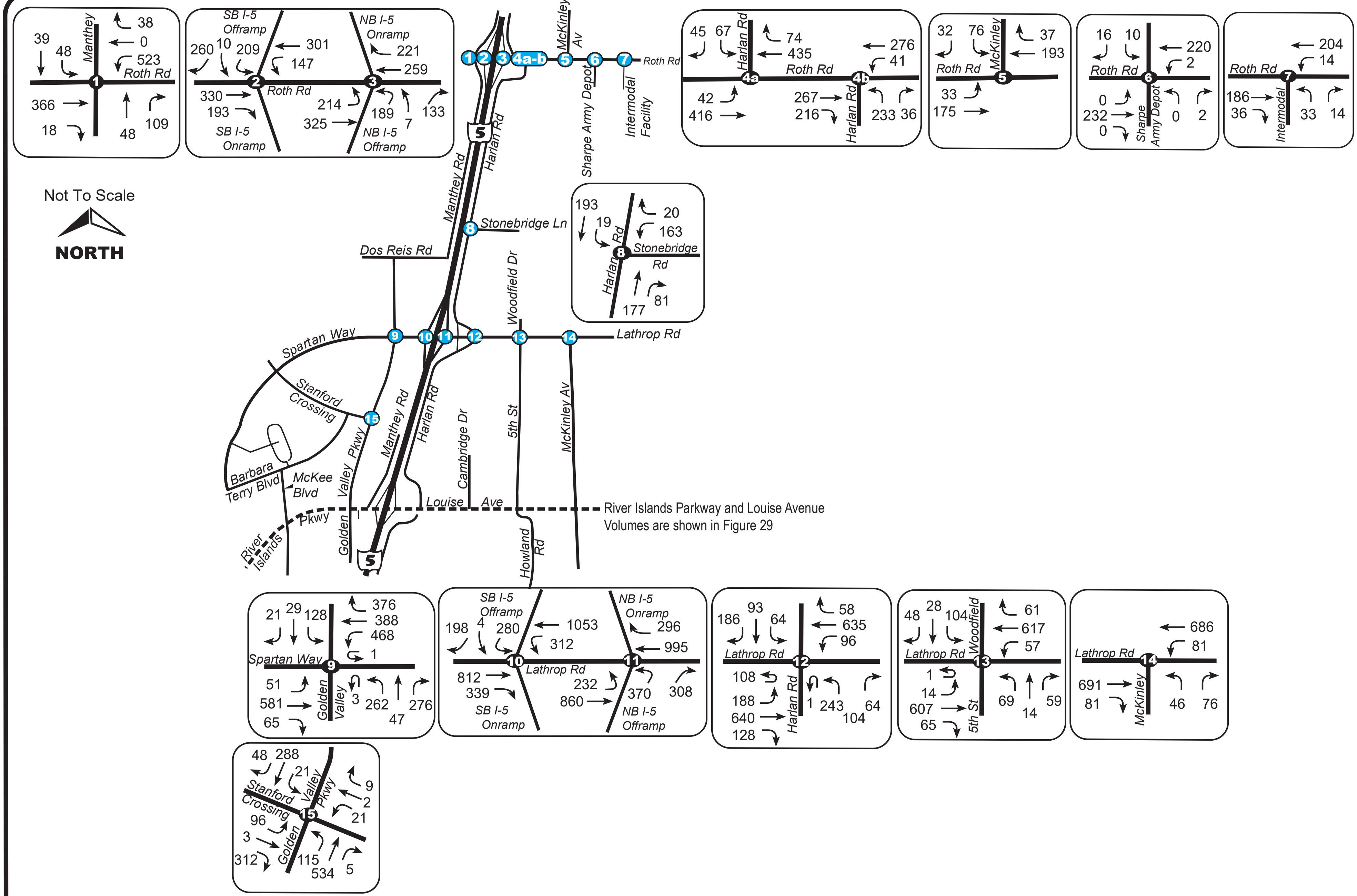
CRANE TRANSPORTATION GROUP

Figure 11
Existing (Year 2022) PM Peak Hour Volumes
Northern Lathrop



CRANE TRANSPORTATION GROUP

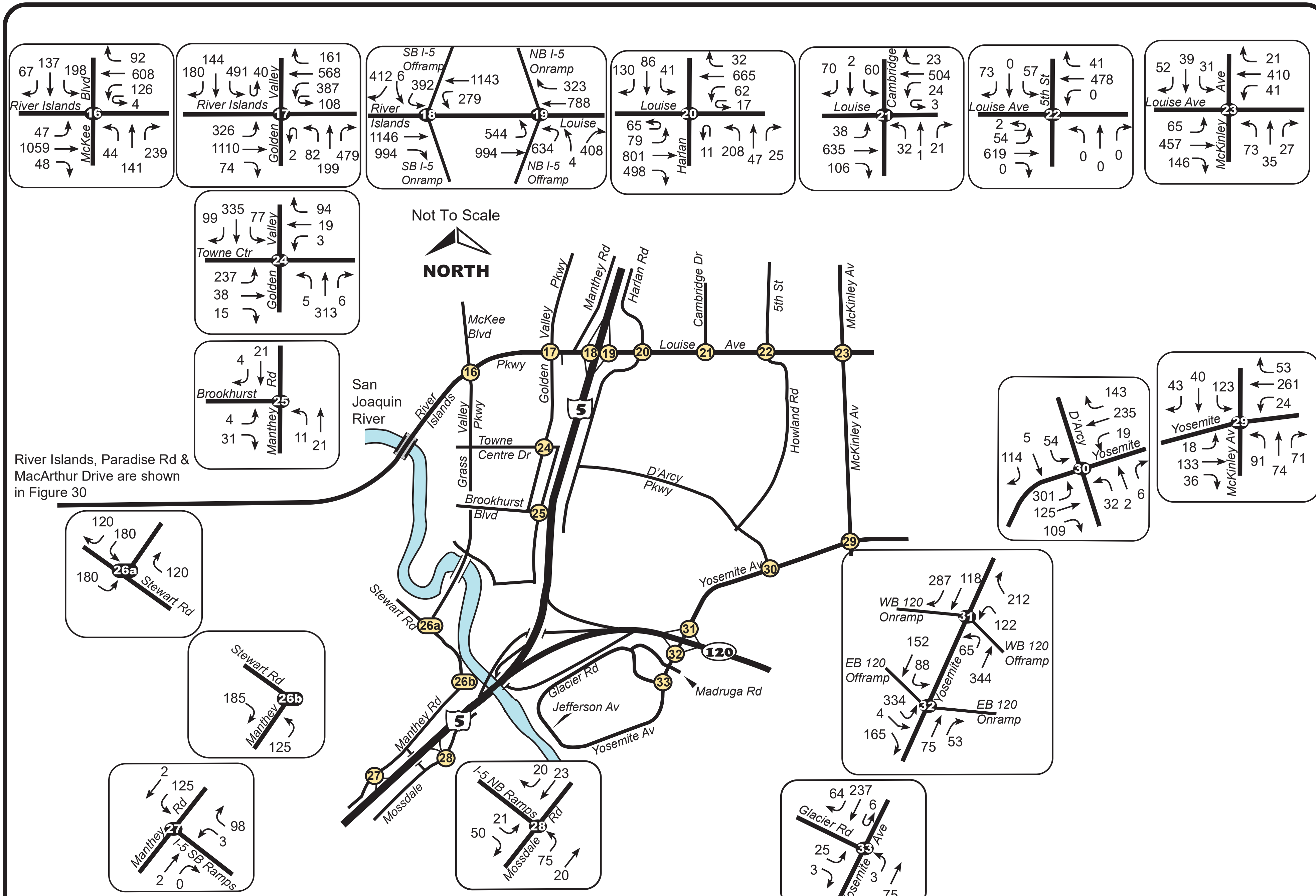
Figure 12
Exsiting (Year 2022 PM) Peak Hour Volumes
Southern Lathrop



2022 Traffic Monitoring Program (TMP) for the City of Lathrop

CRANE TRANSPORTATION GROUP

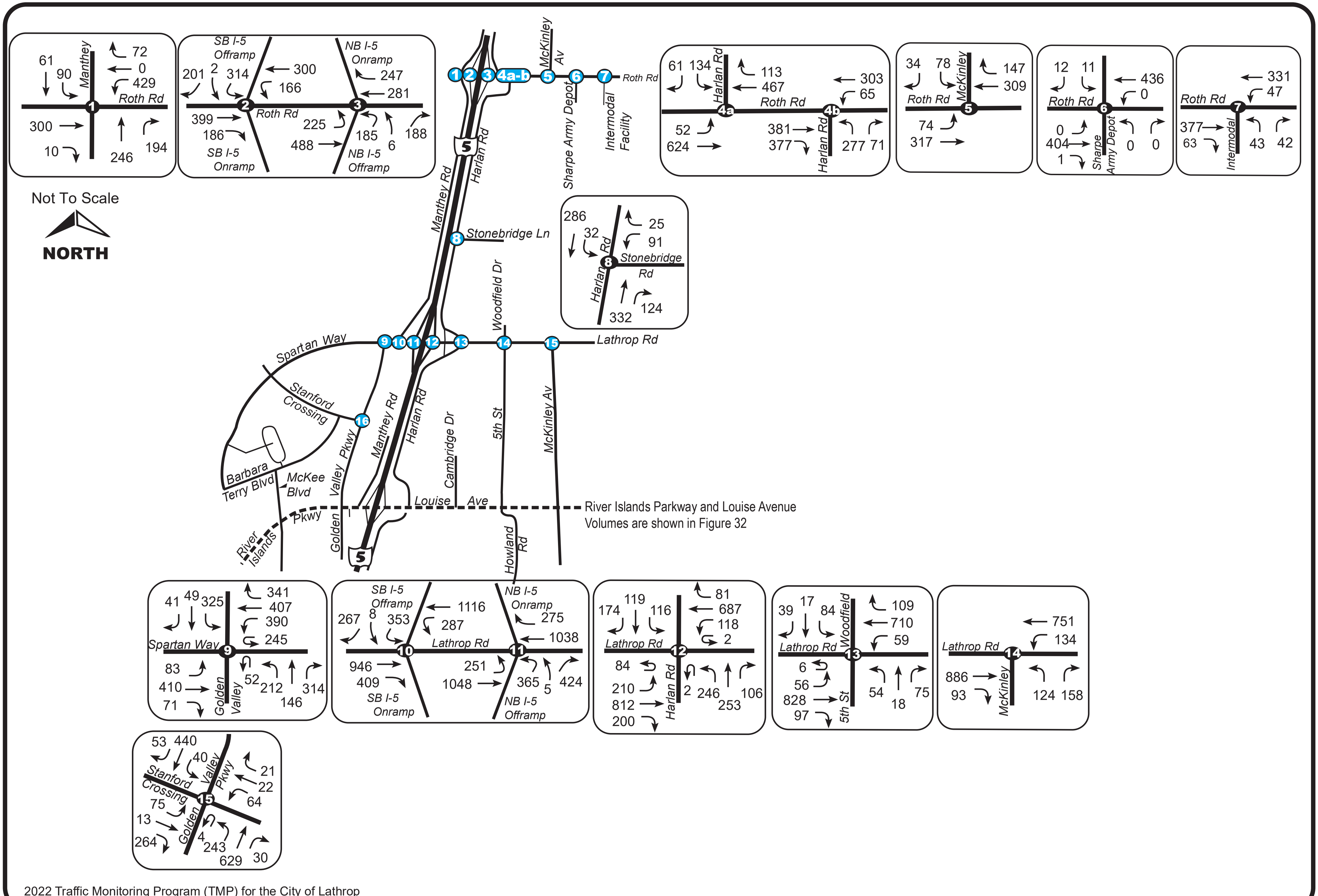
Figure 28
Year 2026 AM Peak Hour Volumes
Northern Lathrop



2022 Traffic Monitoring Program (TMP) for the City of Lathrop

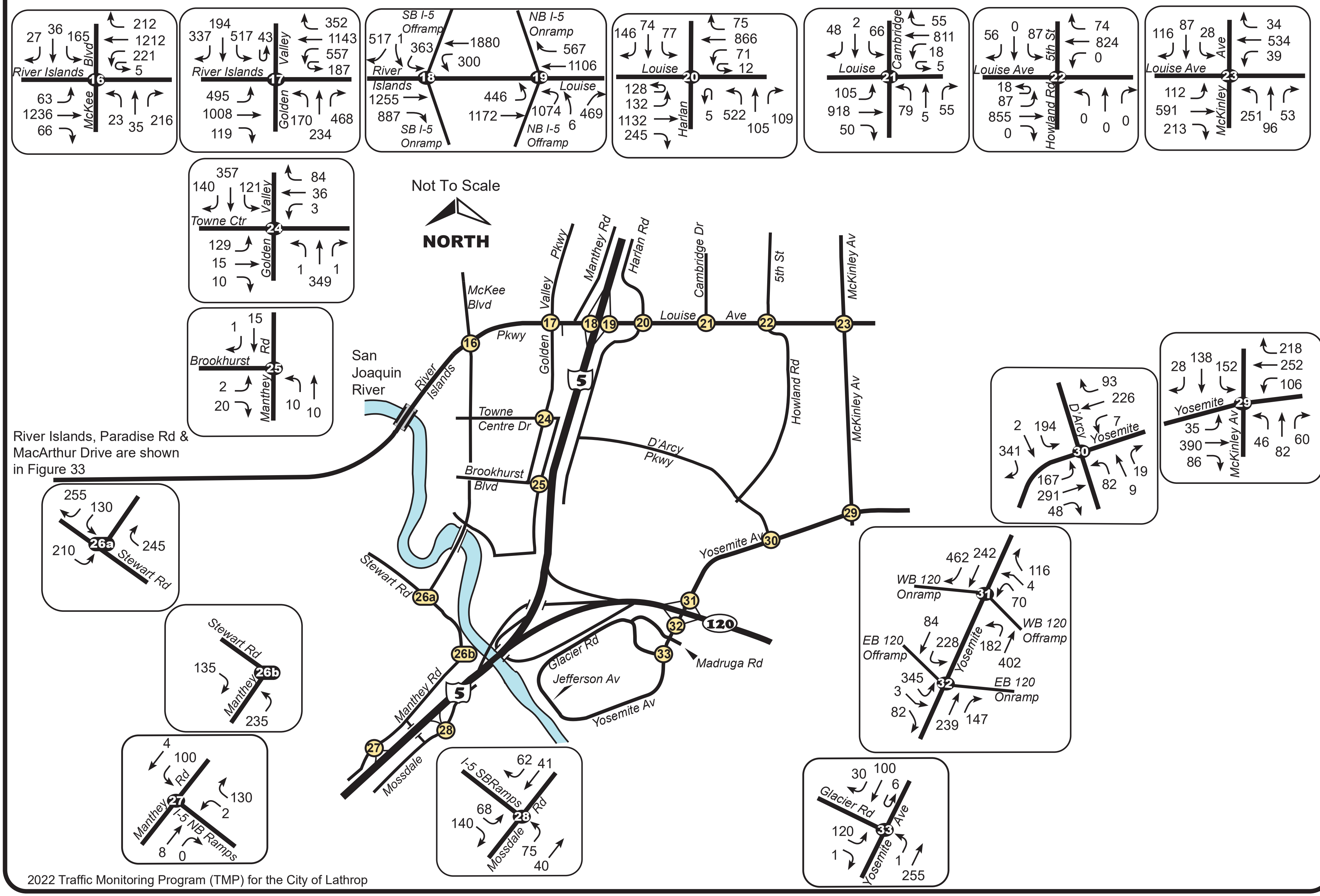
CRANE TRANSPORTATION GROUP

Figure 29
Year 2026 AM Peak Hour Volumes
Southern Lathrop



CRANE TRANSPORTATION GROUP

Figure 31
Year 2026 PM Peak Hour Volumes
Northern Lathrop



CRANE TRANSPORTATION GROUP

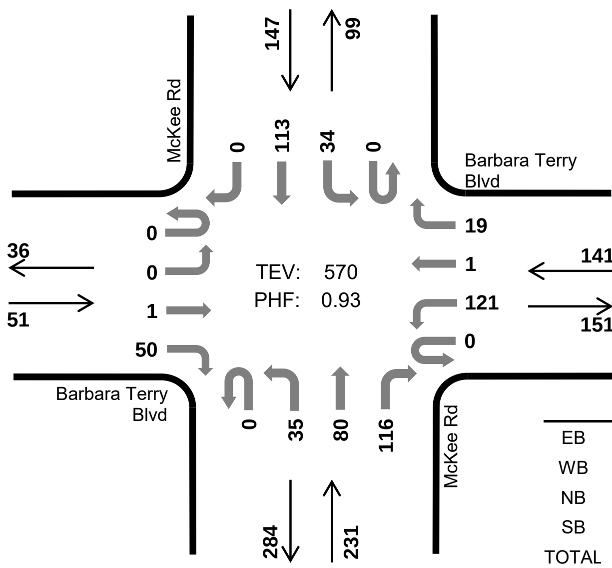
Figure 32
Year 2026 PM Peak Hour Volumes
Southern Lathrop

Appendix C – Intersection Turning Movement Counts

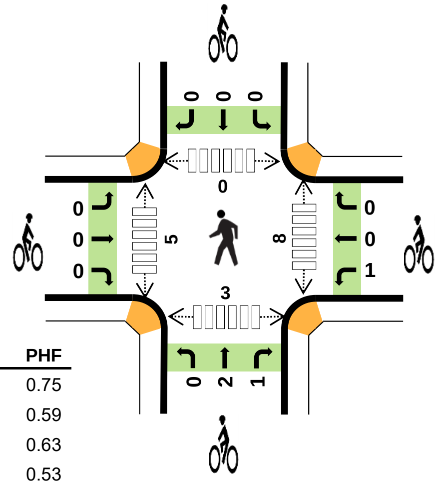
www.idaxdata.com

McKee Rd
Barbara Terry Blvd

Date: 09/27/2022
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	2.0%	0.75
WB	1.4%	0.59
NB	1.7%	0.63
SB	2.0%	0.53
TOTAL	1.8%	0.93



Two-Hour Count Summaries

Interval Start	Barbara Terry Blvd Eastbound UT	LT	TH	RT	Barbara Terry Blvd Westbound UT	LT	TH	RT	McKee Rd Northbound UT	LT	TH	RT	McKee Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	1	2	0	4	0	2	0	2	5	3	0	7	13	0	39	0
7:15 AM	0	0	1	3	0	7	0	0	0	0	6	8	0	9	8	2	44	0
7:30 AM	0	0	0	8	0	10	1	4	0	5	4	8	0	8	24	0	72	0
7:45 AM	**0**	**0**	**1**	**13**	**0**	**11**	**0**	**2**	**0**	**8**	**17**	**10**	**0**	**10**	**60**	**0**	**132**	287
8:00 AM	**0**	**0**	**0**	**12**	**0**	**23**	**1**	**5**	**0**	**8**	**35**	**24**	**0**	**8**	**33**	**0**	**149**	397
8:15 AM	**0**	**0**	**0**	**8**	**0**	**36**	**0**	**3**	**0**	**16**	**19**	**56**	**0**	**9**	**7**	**0**	**154**	507
8:30 AM	**0**	**0**	**0**	**17**	**0**	**51**	**0**	**9**	**0**	**3**	**9**	**26**	**0**	**7**	**13**	**0**	**135**	**570**
8:45 AM	0	0	0	7	0	4	0	1	0	3	12	3	0	3	7	0	40	478
Count Total	0	0	3	70	0	146	2	26	0	45	107	138	0	61	165	2	765	0
Peak Hour All	**0**	**0**	**1**	**50**	**0**	**121**	**1**	**19**	**0**	**35**	**80**	**116**	**0**	**34**	**113**	**0**	**570**	**0**
Peak Hour HV	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**3**	**0**	**1**	**0**	**1**	**2**	**0**	**10**	**0**
Peak Hour HV%	**-**	**-**	**100%**	**0%**	**-**	**1%**	**0%**	**5%**	**-**	**9%**	**0%**	**1%**	**-**	**3%**	**2%**	**-**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	3	0	2	*5*	0	0	0	0	*0*	2	0	3	0	*5*
7:15 AM	0	1	1	2	*4*	0	0	0	0	*0*	3	0	2	0	*5*
7:30 AM	0	0	0	0	*0*	0	0	0	1	*1*	0	5	1	0	*6*
7:45 AM	**1**	**0**	**1**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**3**	**3**	**0**	**0**	*6*
8:00 AM	**0**	**2**	**1**	**3**	***6***	**0**	**1**	**0**	**0**	***1***	**2**	**1**	**0**	**2**	*5*
8:15 AM	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**2**	**0**	***2***	**1**	**1**	**0**	**0**	*2*
8:30 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	***1***	**2**	**0**	**0**	**1**	***3***
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	2	0	2	0	*4*
Count Total	1	6	5	7	*19*	0	1	3	1	*5*	15	10	8	3	*36*
Peak Hour	**1**	**2**	**4**	**3**	***10***	**0**	**1**	**3**	**0**	***4***	**8**	**5**	**0**	**3**	***16***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Barbara Terry Blvd				Barbara Terry Blvd				McKee Rd				McKee Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	2	0	1	0	0	0	0	0	0	2	0	5	0
7:15 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	2	0	4	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	11
8:00 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**1**	**2**	**0**	**6**	12
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	10
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Count Total	0	0	1	0	0	4	0	2	0	3	1	1	0	1	6	0	19	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**3**	**0**	**1**	**0**	**1**	**2**	**0**	**10**	**0**

Two-Hour Count Summaries - Bikes

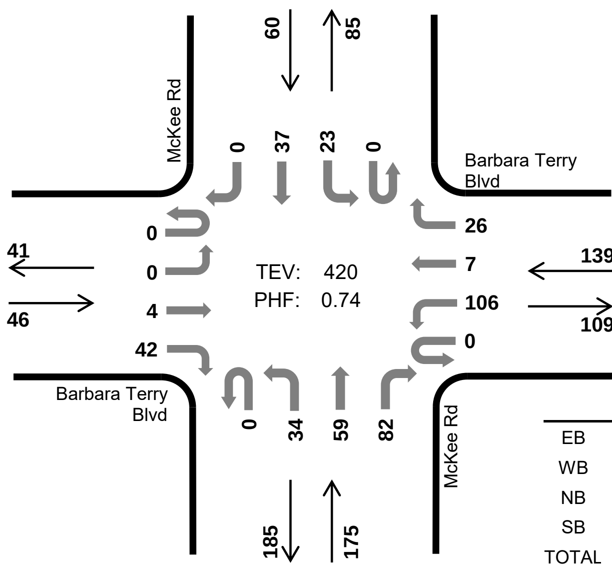
Interval Start	Barbara Terry Blvd			Barbara Terry Blvd			McKee Rd			McKee Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
8:00 AM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	2
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**2**	4
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**4**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Count Total	0	0	0	1	0	0	0	2	1	0	1	0	5	0
Peak Hour	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**4**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

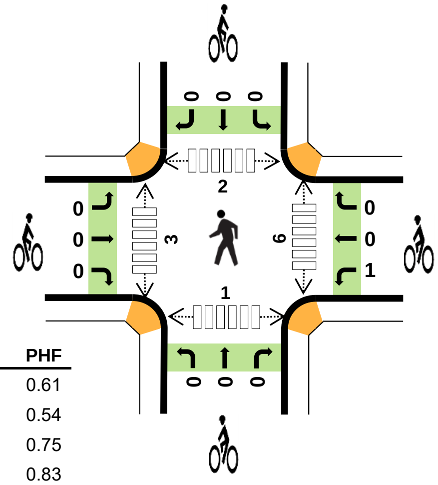
McKee Rd
Barbara Terry Blvd

Date: 09/27/2022
Count Period: 3:00 PM to 6:00 PM
Peak Hour: 3:15 PM to 4:15 PM

Peak Hour



	HV %:	PHF
EB	6.5%	0.61
WB	0.7%	0.54
NB	0.6%	0.75
SB	1.7%	0.83
TOTAL	1.4%	0.74



Three-Hour Count Summaries

Interval Start		Barbara Terry Blvd Eastbound UT	LT	TH	RT	Barbara Terry Blvd Westbound UT	LT	TH	RT	McKee Rd Northbound UT	LT	TH	RT	McKee Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
3:15 PM		0	0	0	3	0	8	1	3	0	10	18	27	0	5	13	0	88	0
3:30 PM		0	0	1	6	0	51	2	11	0	10	14	34	0	8	5	0	142	0
3:45 PM		0	0	2	15	0	43	2	11	0	6	9	18	0	5	7	0	118	0
4:00 PM		0	0	1	18	0	4	2	1	0	8	18	3	0	5	12	0	72	420
Peak Hour	All	0	0	4	42	0	106	7	26	0	34	59	82	0	23	37	0	420	0
	HV	0	0	0	3	0	1	0	0	0	1	0	0	0	1	0	0	6	0
	HV%	-	-	0%	7%	-	1%	0%	0%	-	3%	0%	0%	-	4%	0%	-	1%	0

Note: For all three-hour count summary, see next page.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
3:15 PM	1	1	0	0	*2*	0	0	0	0	*0*	3	1	0	0	*4*
3:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	2	1	0	*3*
3:45 PM	1	0	0	0	*1*	0	1	0	0	*1*	2	0	0	1	*3*
4:00 PM	1	0	1	1	*3*	0	0	0	0	*0*	1	0	1	0	*2*
Peak Hour	3	1	1	1	*6*	0	1	0	0	*1*	6	3	2	1	*12*

Three-Hour Count Summaries

Interval Start	Barbara Terry Blvd Eastbound UT	LT	TH	RT	Barbara Terry Blvd Westbound UT	LT	TH	RT	McKee Rd Northbound UT	LT	TH	RT	McKee Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
3:00 PM	0	0	0	6	0	3	1	5	0	6	18	18	0	3	6	0	66	0
3:15 PM	**0**	**0**	**0**	**3**	**0**	**8**	**1**	**3**	**0**	**10**	**18**	**27**	**0**	**5**	**13**	**0**	**88**	0
3:30 PM	**0**	**0**	**1**	**6**	**0**	**51**	**2**	**11**	**0**	**10**	**14**	**34**	**0**	**8**	**5**	**0**	**142**	0
3:45 PM	**0**	**0**	**2**	**15**	**0**	**43**	**2**	**11**	**0**	**6**	**9**	**18**	**0**	**5**	**7**	**0**	**118**	414
4:00 PM	**0**	**0**	**1**	**18**	**0**	**4**	**2**	**1**	**0**	**8**	**18**	**3**	**0**	**5**	**12**	**0**	**72**	**420**
4:15 PM	0	0	0	5	0	3	0	6	0	4	14	13	0	4	15	0	64	396
4:30 PM	0	0	1	6	0	5	0	2	0	6	12	6	0	0	19	0	57	311
4:45 PM	0	0	0	7	0	6	0	6	0	10	17	7	0	3	4	0	60	253
5:00 PM	0	0	0	4	0	6	1	6	0	5	22	12	0	8	12	0	76	257
5:15 PM	0	0	1	8	0	9	1	3	0	4	22	4	0	4	6	0	62	255
5:30 PM	0	0	3	3	0	2	0	10	0	3	21	11	0	7	15	0	75	273
5:45 PM	0	0	0	6	0	10	1	7	0	9	16	6	0	2	10	0	67	280
Count Total	0	0	9	87	0	150	11	71	0	81	201	159	0	54	124	0	947	0
Peak Hour All	**0**	**0**	**4**	**42**	**0**	**106**	**7**	**26**	**0**	**34**	**59**	**82**	**0**	**23**	**37**	**0**	**420**	**0**
Peak Hour HV	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**6**	**0**
Peak Hour HV%	**-**	**-**	**0%**	**7%**	**-**	**1%**	**0%**	**0%**	**-**	**3%**	**0%**	**0%**	**-**	**4%**	**0%**	**-**	**1%**	**0**

Note: Three-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
3:00 PM	0	0	1	0	*1*	0	0	1	0	*1*	0	1	1	0	*2*
3:15 PM	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**3**	**1**	**0**	**0**	*4*
3:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**1**	**0**	*3*
3:45 PM	**1**	**0**	**0**	**0**	***1***	**0**	**1**	**0**	**0**	***1***	**2**	**0**	**0**	**1**	*3*
4:00 PM	**1**	**0**	**1**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**1**	**0**	*2*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	0	0	0	*0*	0	1	0	0	*1*	0	0	0	0	*0*
4:45 PM	0	0	2	0	*2*	0	0	0	0	*0*	0	6	1	2	*9*
5:00 PM	0	0	2	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	1	1	0	*2*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	2	0	0	0	*2*
Count Total	3	2	7	1	*13*	0	2	1	0	*3*	8	11	5	3	*27*
Peak Hour	**3**	**1**	**1**	**1**	***6***	**0**	**1**	**0**	**0**	***1***	**6**	**3**	**2**	**1**	***12***

Three-Hour Count Summaries - Heavy Vehicles

Interval Start	Barbara Terry Blvd Eastbound				Barbara Terry Blvd Westbound				McKee Rd Northbound				McKee Rd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
3:15 PM	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	0
3:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:45 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	4
4:00 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**6**
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	5
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	4
5:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	5
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	6
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Count Total	0	0	0	3	0	2	0	0	0	2	3	2	0	1	0	0	13	0
Peak Hour	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**6**	**0**

Three-Hour Count Summaries - Bikes

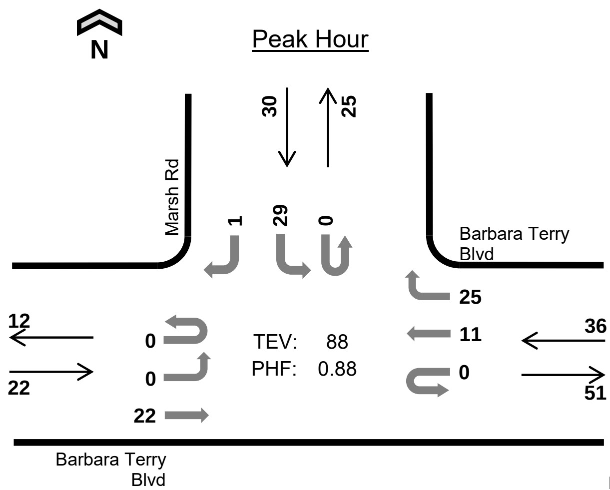
Interval Start	Barbara Terry Blvd Eastbound			Barbara Terry Blvd Westbound			McKee Rd Northbound			McKee Rd Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
3:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
3:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:45 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	2
4:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	2	0	0	0	1	0	0	0	0	3	0
Peak Hour	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

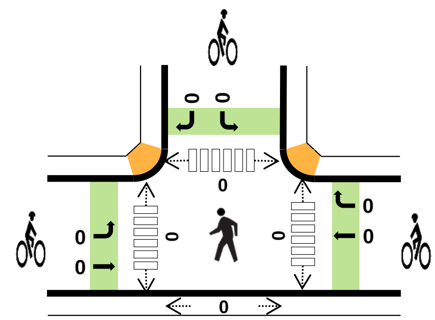
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Marsh Rd
Barbara Terry Blvd

Date: 09/27/2022
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour





	HV %:	PHF
EB	4.5%	0.42
WB	8.3%	0.56
NB	-	-
SB	0.0%	0.63
TOTAL	4.5%	0.88

Two-Hour Count Summaries

Interval Start		Barbara Terry Blvd Eastbound UT	LT	TH	RT	Barbara Terry Blvd Westbound UT	LT	TH	RT	n/a Northbound UT	LT	TH	RT	Marsh Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	0	0	0	0	0	1	1	0	0	0	0	0	3	0	0	5	0
7:15 AM		0	0	1	0	0	0	2	0	0	0	0	0	0	3	0	0	6	0
7:30 AM		0	1	2	0	0	0	4	2	0	0	0	0	0	7	0	0	16	0
7:45 AM		**0**	**0**	**1**	**0**	**0**	**0**	**2**	**6**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**21**	48
8:00 AM		**0**	**0**	**2**	**0**	**0**	**0**	**2**	**6**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**1**	**21**	64
8:15 AM		**0**	**0**	**6**	**0**	**0**	**0**	**5**	**11**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**25**	83
8:30 AM		**0**	**0**	**13**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**21**	**88**
8:45 AM		0	0	1	0	0	0	1	2	0	0	0	0	0	6	0	0	10	77
Count Total		0	1	26	0	0	0	19	30	0	0	0	0	0	48	0	1	125	0
Peak Hour	**All**	**0**	**0**	**22**	**0**	**0**	**0**	**11**	**25**	**0**	**0**	**0**	**0**	**0**	**29**	**0**	**1**	**88**	**0**
	HV	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**
	HV%	**-**	**-**	**5%**	**-**	**-**	**-**	**27%**	**0%**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**5%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	1	0	*1*
7:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	2	0	*2*
7:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	1	0	*2*
7:45 AM	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:30 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	1	3	0	0	*4*	0	0	0	0	*0*	0	1	4	0	*5*
Peak Hr	**1**	**3**	**0**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Barbara Terry Blvd Eastbound UT	LT	TH	RT	Barbara Terry Blvd Westbound UT	LT	TH	RT	n/a Northbound UT	LT	TH	RT	Marsh Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	2
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	3
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	4
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	4	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**

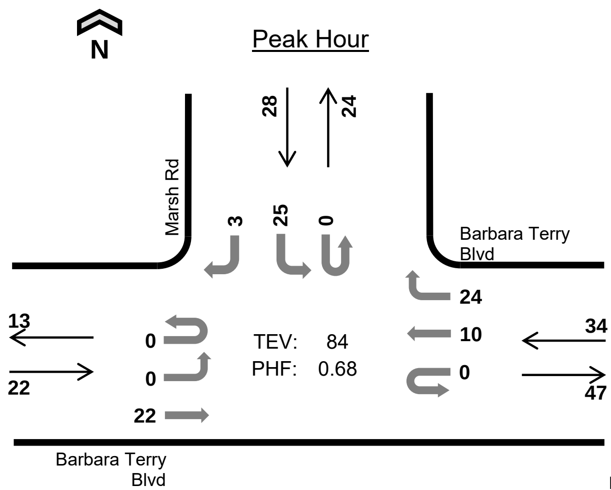
Two-Hour Count Summaries - Bikes

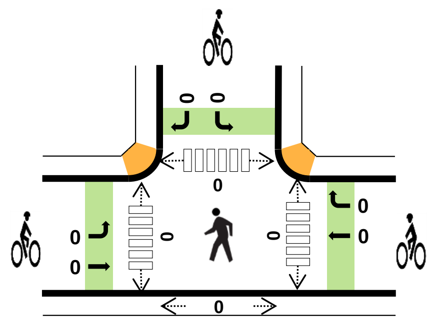
Interval Start	Barbara Terry Blvd Eastbound LT	TH	RT	Barbara Terry Blvd Westbound LT	TH	RT	n/a Northbound LT	TH	RT	Marsh Rd Southbound LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Marsh Rd
Barbara Terry Blvd

Date: 09/27/2022
Count Period: 3:00 PM to 6:00 PM
Peak Hour: 3:15 PM to 4:15 PM





	HV %:	PHF
EB	4.5%	0.50
WB	2.9%	0.71
NB	-	-
SB	3.6%	0.88
TOTAL	3.6%	0.68

Three-Hour Count Summaries

Interval Start		Barbara Terry Blvd Eastbound UT	LT	TH	RT	Barbara Terry Blvd Westbound UT	LT	TH	RT	n/a Northbound UT	LT	TH	RT	Marsh Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
3:15 PM		0	0	0	0	0	0	3	7	0	0	0	0	0	6	0	2	18	0
3:30 PM		0	0	6	0	0	0	4	2	0	0	0	0	0	4	0	0	16	0
3:45 PM		0	0	11	0	0	0	3	9	0	0	0	0	0	8	0	0	31	0
4:00 PM		0	0	5	0	0	0	0	6	0	0	0	0	0	7	0	1	19	84
Peak Hour	All	0	0	22	0	0	0	10	24	0	0	0	0	0	25	0	3	84	0
	HV	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	3	0
	HV%	-	-	5%	-	-	-	10%	0%	-	-	-	-	-	0%	-	33%	4%	0

Note: For all three-hour count summary, see next page.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
3:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
3:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
3:45 PM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:00 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hour	1	1	0	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*

Three-Hour Count Summaries

Interval Start	Barbara Terry Blvd				Barbara Terry Blvd				n/a				Marsh Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	0	0	0	0	0	0	1	4	0	0	0	0	0	3	0	0	8	0
3:15 PM	0	0	0	0	0	0	3	7	0	0	0	0	0	6	0	2	18	0
3:30 PM	0	0	6	0	0	0	4	2	0	0	0	0	0	4	0	0	16	0
3:45 PM	0	0	11	0	0	0	3	9	0	0	0	0	0	8	0	0	31	73
4:00 PM	0	0	5	0	0	0	0	6	0	0	0	0	0	7	0	1	19	84
4:15 PM	0	0	0	0	0	0	0	7	0	0	0	0	0	7	0	0	14	80
4:30 PM	0	0	2	0	0	0	0	9	0	0	0	0	0	1	0	0	12	76
4:45 PM	0	0	1	0	0	0	0	10	0	0	0	0	0	5	0	0	16	61
5:00 PM	0	0	0	0	0	0	2	7	0	0	0	0	0	5	0	0	14	56
5:15 PM	0	0	3	0	0	0	1	4	0	0	0	0	0	3	0	0	11	53
5:30 PM	0	0	2	0	0	0	1	8	0	0	0	0	0	3	0	0	14	55
5:45 PM	0	0	3	0	0	0	1	8	0	0	0	0	0	4	0	0	16	55
Count Total	0	0	33	0	0	0	16	81	0	0	0	0	0	56	0	3	189	0
Peak Hour All	0	0	22	0	0	0	10	24	0	0	0	0	0	25	0	3	84	0
Peak Hour HV	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	3	0
Peak Hour HV%	-	-	5%	-	-	-	10%	0%	-	-	-	-	-	0%	-	33%	4%	0

Note: Three-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	2	2	0	1	5	2	2	0	0	4	0	0	0	0	0
Peak Hr	1	1	0	1	3	0	0	0	0	0	0	0	0	0	0

Three-Hour Count Summaries - Heavy Vehicles

Interval Start	Barbara Terry Blvd				Barbara Terry Blvd				n/a				Marsh Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:45 PM	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	2
4:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**3**
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:30 PM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	5
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	1	5	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**

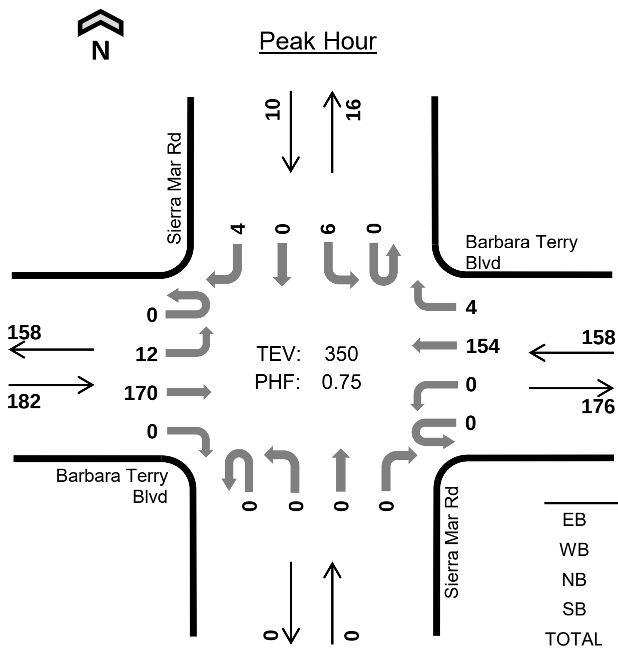
Three-Hour Count Summaries - Bikes

Interval Start	Barbara Terry Blvd			Barbara Terry Blvd			n/a			Marsh Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	2	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	2	0	0	0	0	0	0	0	2	4
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Count Total	0	2	0	0	2	0	0	0	0	0	0	0	4	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

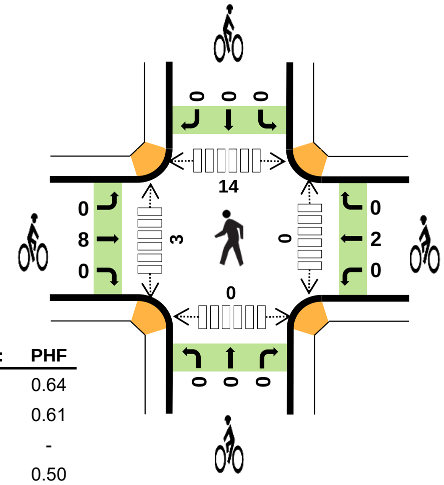
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Sierra Mar Rd
Barbara Terry Blvd

Date: 09/27/2022
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	2.7%	0.64
WB	0.6%	0.61
NB	-	-
SB	0.0%	0.50
TOTAL	1.7%	0.75



Two-Hour Count Summaries

Interval Start	Barbara Terry Blvd Eastbound UT	LT	TH	RT	Barbara Terry Blvd Westbound UT	LT	TH	RT	Sierra Mar Rd Northbound UT	LT	TH	RT	Sierra Mar Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	1	16	0	0	0	7	0	0	0	0	0	0	0	0	0	24	0
7:15 AM	0	3	21	0	0	0	7	1	0	0	0	0	0	2	0	1	35	0
7:30 AM	0	1	19	0	0	0	13	0	0	0	0	0	0	1	0	2	36	0
7:45 AM	**0**	**4**	**19**	**0**	**0**	**0**	**15**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**41**	136
8:00 AM	**0**	**0**	**43**	**0**	**0**	**0**	**29**	**3**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**2**	**80**	192
8:15 AM	**0**	**4**	**67**	**0**	**0**	**0**	**45**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**117**	274
8:30 AM	**0**	**4**	**41**	**0**	**0**	**0**	**65**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**112**	**350**
8:45 AM	0	1	5	0	0	0	4	1	0	0	0	0	0	1	0	0	12	321
Count Total	0	18	231	0	0	0	185	6	0	0	0	0	0	10	0	7	457	0
Peak Hour All	**0**	**12**	**170**	**0**	**0**	**0**	**154**	**4**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**4**	**350**	**0**
HV	**0**	**1**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**
HV%	**-**	**8%**	**2%**	**-**	**-**	**-**	**1%**	**0%**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	3	0	0	*3*	0	0	0	0	*0*	0	0	5	0	*5*
7:15 AM	1	2	0	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	**1**	**0**	**0**	**0**	***1***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**3**	**0**	*3*
8:00 AM	**3**	**1**	**0**	**0**	***4***	**2**	**1**	**0**	**0**	***3***	**0**	**2**	**6**	**0**	*8*
8:15 AM	**1**	**0**	**0**	**0**	***1***	**5**	**1**	**0**	**0**	***6***	**0**	**0**	**3**	**0**	*3*
8:30 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**2**	**0**	***3***
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	6	6	0	0	*12*	8	2	0	0	*10*	0	3	19	0	*22*
Peak Hour	**5**	**1**	**0**	**0**	***6***	**8**	**2**	**0**	**0**	***10***	**0**	**3**	**14**	**0**	***17***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Barbara Terry Blvd				Barbara Terry Blvd				Sierra Mar Rd				Sierra Mar Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3	0
7:15 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	7
8:00 AM	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	8
8:15 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	6
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Count Total	0	1	5	0	0	0	6	0	0	0	0	0	0	0	0	0	12	0
Peak Hour	**0**	**1**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**

Two-Hour Count Summaries - Bikes

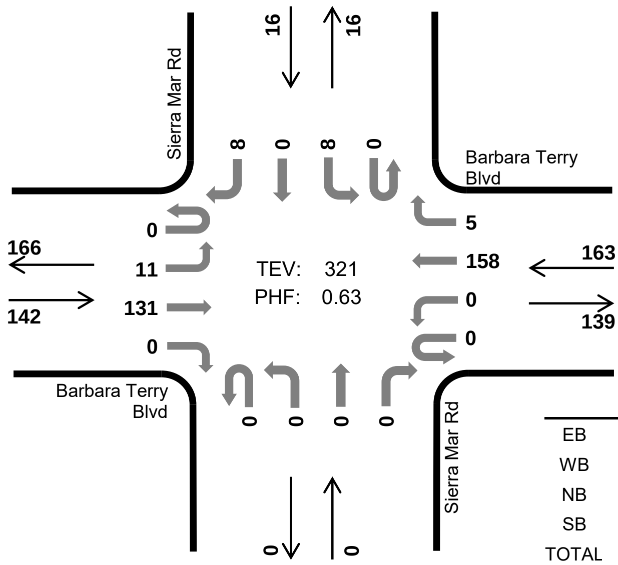
Interval Start	Barbara Terry Blvd			Barbara Terry Blvd			Sierra Mar Rd			Sierra Mar Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	1
8:00 AM	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	4
8:15 AM	**0**	**5**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	10
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Count Total	0	8	0	0	2	0	0	0	0	0	0	0	10	0
Peak Hour	**0**	**8**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

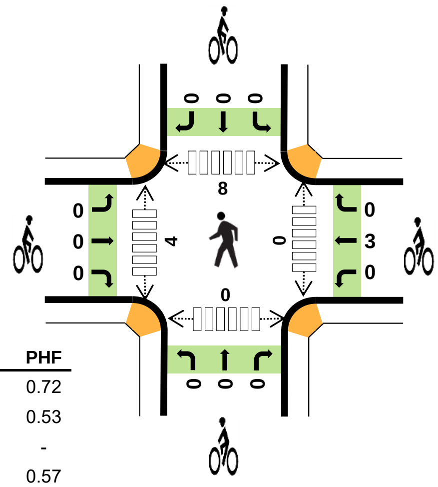
Sierra Mar Rd
Barbara Terry Blvd

Date: 09/27/2022
Count Period: 3:00 PM to 6:00 PM
Peak Hour: 3:00 PM to 4:00 PM

Peak Hour



	HV %:	PHF
EB	0.0%	0.72
WB	1.2%	0.53
NB	-	-
SB	6.3%	0.57
TOTAL	0.9%	0.63



Three-Hour Count Summaries

Interval Start		Barbara Terry Blvd Eastbound UT	LT	TH	RT	Barbara Terry Blvd Westbound UT	LT	TH	RT	Sierra Mar Rd Northbound UT	LT	TH	RT	Sierra Mar Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
3:00 PM		0	4	17	0	0	0	12	3	0	0	0	0	0	3	0	2	41	0
3:15 PM		0	3	36	0	0	0	9	0	0	0	0	0	0	3	0	4	55	0
3:30 PM		0	1	48	0	0	0	76	1	0	0	0	0	0	1	0	1	128	0
3:45 PM		0	3	30	0	0	0	61	1	0	0	0	0	0	1	0	1	97	321
Peak Hour	All	0	11	131	0	0	0	158	5	0	0	0	0	0	8	0	8	321	0
	HV	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	3	0
	HV%	-	0%	0%	-	-	-	1%	0%	-	-	-	-	-	0%	-	13%	1%	0

Note: For all three-hour count summary, see next page.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
3:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
3:15 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
3:30 PM	0	0	0	0	*0*	0	3	0	0	*3*	0	0	1	0	*1*
3:45 PM	0	1	0	1	*2*	0	0	0	0	*0*	0	4	7	0	*11*
Peak Hour	0	2	0	1	*3*	0	3	0	0	*3*	0	4	8	0	*12*

Three-Hour Count Summaries

Interval Start	Barbara Terry Blvd Eastbound UT	LT	TH	RT	Barbara Terry Blvd Westbound UT	LT	TH	RT	Sierra Mar Rd Northbound UT	LT	TH	RT	Sierra Mar Rd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
3:00 PM	**0**	**4**	**17**	**0**	**0**	**0**	**12**	**3**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**2**	**41**	0
3:15 PM	**0**	**3**	**36**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**4**	**55**	0
3:30 PM	**0**	**1**	**48**	**0**	**0**	**0**	**76**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**128**	0
3:45 PM	**0**	**3**	**30**	**0**	**0**	**0**	**61**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**97**	**321**
4:00 PM	0	0	12	0	0	0	12	0	0	0	0	0	0	2	0	0	26	306
4:15 PM	0	2	16	0	0	0	10	0	0	0	0	0	0	1	0	2	31	282
4:30 PM	0	0	10	0	0	0	15	0	0	0	0	0	0	1	0	2	28	182
4:45 PM	0	0	12	0	0	0	15	0	0	0	0	0	0	0	0	0	27	112
5:00 PM	0	1	23	0	0	0	14	0	0	0	0	0	0	2	0	1	41	127
5:15 PM	0	0	12	0	0	0	16	0	0	0	0	0	0	0	0	0	28	124
5:30 PM	0	1	22	0	0	0	20	1	0	0	0	0	0	0	0	0	44	140
5:45 PM	0	1	10	0	0	0	20	0	0	0	0	0	0	1	0	0	32	145
Count Total	0	16	248	0	0	0	280	6	0	0	0	0	0	15	0	13	578	0
Peak Hour All	**0**	**11**	**131**	**0**	**0**	**0**	**158**	**5**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**8**	**321**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**
Peak Hour HV%	**-**	**0%**	**0%**	**-**	**-**	**-**	**1%**	**0%**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**13%**	**1%**	**0**

Note: Three-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
3:00 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
3:15 PM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
3:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**3**	**0**	**0**	***3***	**0**	**0**	**1**	**0**	*1*
3:45 PM	**0**	**1**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**7**	**0**	***11***
4:00 PM	0	1	0	0	*1*	0	1	0	0	*1*	0	0	0	0	*0*
4:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	0	0	0	*0*	0	1	0	0	*1*	0	0	0	0	*0*
4:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	1	0	*1*
5:00 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	1	0	*1*
5:15 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	2	0	*2*
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	3	0	*3*
5:45 PM	1	0	0	0	*1*	1	0	0	0	*1*	0	0	1	0	*1*
Count Total	2	4	0	1	*7*	1	5	0	0	*6*	0	4	16	0	*20*
Peak Hour	**0**	**2**	**0**	**1**	***3***	**0**	**3**	**0**	**0**	***3***	**0**	**4**	**8**	**0**	***12***

Three-Hour Count Summaries - Heavy Vehicles

Interval Start	Barbara Terry Blvd				Barbara Terry Blvd				Sierra Mar Rd				Sierra Mar Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	0
3:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**3**
4:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	4
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
Count Total	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	1	7	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**

Three-Hour Count Summaries - Bikes

Interval Start	Barbara Terry Blvd			Barbara Terry Blvd			Sierra Mar Rd			Sierra Mar Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
3:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
3:30 PM	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	0
3:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	4
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	1
Count Total	0	1	0	0	5	0	0	0	0	0	0	0	6	0
Peak Hour	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Appendix D – 2022 Existing Conditions Level of Service Sheets

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	380	43	199	399	209	198
Future Volume (veh/h)	380	43	199	399	209	198
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	594	67	221	443	279	264
Peak Hour Factor	0.64	0.64	0.90	0.90	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1044	466	515	1947	410	643
Arrive On Green	0.29	0.29	0.15	0.55	0.23	0.23
Sat Flow, veh/h	3647	1585	3456	3647	1781	2790
Grp Volume(v), veh/h	594	67	221	443	279	264
Grp Sat Flow(s),veh/h/ln	1777	1585	1728	1777	1781	1395
Q Serve(g_s), s	6.2	1.4	2.5	2.8	6.3	3.5
Cycle Q Clear(g_c), s	6.2	1.4	2.5	2.8	6.3	3.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1044	466	515	1947	410	643
V/C Ratio(X)	0.57	0.14	0.43	0.23	0.68	0.41
Avail Cap(c_a), veh/h	4061	1811	1580	6059	2085	3265
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.1	11.4	16.9	5.1	15.4	14.3
Incr Delay (d2), s/veh	0.5	0.1	0.6	0.1	2.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.4	0.9	0.6	2.1	0.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.6	11.5	17.5	5.2	17.4	14.7
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	661			664	543	
Approach Delay, s/veh	13.4			9.3	16.1	
Approach LOS	B			A	B	

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.1	18.0				29.1		14.7
Change Period (Y+Rc), s	4.6	5.1				5.1		4.6
Max Green Setting (Gmax), s	20.0	50.0				74.6		51.2
Max Q Clear Time (g_c+I1), s	4.5	8.2				4.8		8.3
Green Ext Time (p_c), s	0.6	4.7				3.2		1.8

Intersection Summary			
HCM 6th Ctrl Delay			12.7
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	0	152	1	0	3	65	455	0	3	225	16
Future Volume (veh/h)	19	0	152	1	0	3	65	455	0	3	225	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	0	258	2	0	6	87	607	0	4	331	24
Peak Hour Factor	0.59	0.59	0.59	0.50	0.50	0.50	0.75	0.75	0.75	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	91	0	378	7	0	303	183	1612	0	14	1073	77
Arrive On Green	0.05	0.00	0.24	0.00	0.00	0.19	0.10	0.32	0.00	0.01	0.22	0.22
Sat Flow, veh/h	1781	0	1585	1781	0	1585	1781	5274	0	1781	4864	348
Grp Volume(v), veh/h	32	0	258	2	0	6	87	607	0	4	230	125
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1585	1781	1702	0	1781	1702	1808
Q Serve(g_s), s	0.8	0.0	6.7	0.1	0.0	0.1	2.1	4.2	0.0	0.1	2.6	2.6
Cycle Q Clear(g_c), s	0.8	0.0	6.7	0.1	0.0	0.1	2.1	4.2	0.0	0.1	2.6	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.19
Lane Grp Cap(c), veh/h	91	0	378	7	0	303	183	1612	0	14	751	399
V/C Ratio(X)	0.35	0.00	0.68	0.29	0.00	0.02	0.48	0.38	0.00	0.30	0.31	0.31
Avail Cap(c_a), veh/h	393	0	1224	393	0	1224	786	3942	0	393	1877	997
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.8	0.0	15.7	22.5	0.0	14.9	19.2	12.0	0.0	22.4	14.8	14.8
Incr Delay (d2), s/veh	2.3	0.0	3.1	22.0	0.0	0.0	1.9	0.2	0.0	11.7	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.5	0.1	0.0	0.0	0.8	1.1	0.0	0.1	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	0.0	18.8	44.5	0.0	14.9	21.1	12.3	0.0	34.0	15.1	15.4
LnGrp LOS	C	A	B	D	A	B	C	B	A	C	B	B
Approach Vol, veh/h		290			8			694			359	
Approach Delay, s/veh		19.3			22.3			13.4			15.4	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	15.5	9.3	15.8	6.9	13.4	4.9	20.1
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	2.1	8.7	4.1	4.6	2.8	2.1	2.1	6.2
Green Ext Time (p_c), s	0.0	2.5	0.1	2.6	0.0	0.0	0.0	5.6

Intersection Summary	
HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	527	29	292	317	82	43	145	208	79	109	141
Future Volume (veh/h)	235	527	29	292	317	82	43	145	208	79	109	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	276	620	34	348	377	98	52	175	251	120	165	214
Peak Hour Factor	0.85	0.85	0.85	0.84	0.84	0.84	0.83	0.83	0.83	0.66	0.66	0.66
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	340	1151	357	583	1037	322	87	864	472	252	987	306
Arrive On Green	0.19	0.23	0.23	0.17	0.20	0.20	0.05	0.17	0.17	0.07	0.19	0.19
Sat Flow, veh/h	1781	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	276	620	34	348	377	98	52	175	251	120	165	214
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	8.8	6.3	1.0	5.5	3.8	3.1	1.7	1.7	4.9	2.0	1.6	7.4
Cycle Q Clear(g_c), s	8.8	6.3	1.0	5.5	3.8	3.1	1.7	1.7	4.9	2.0	1.6	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	340	1151	357	583	1037	322	87	864	472	252	987	306
V/C Ratio(X)	0.81	0.54	0.10	0.60	0.36	0.30	0.60	0.20	0.53	0.48	0.17	0.70
Avail Cap(c_a), veh/h	754	3457	1073	1462	3457	1073	754	3025	1653	1462	3025	939
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.9	20.2	18.1	22.7	20.3	20.0	27.5	21.1	22.4	26.3	19.9	22.2
Incr Delay (d2), s/veh	4.6	0.4	0.1	1.0	0.2	0.5	6.5	0.1	0.9	1.4	0.1	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	2.2	0.3	2.0	1.3	1.0	0.8	0.6	1.4	0.8	0.5	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	20.6	18.2	23.7	20.5	20.5	34.1	21.2	23.3	27.7	19.9	25.1
LnGrp LOS	C	C	B	C	C	C	C	C	C	C	B	C
Approach Vol, veh/h		930			823			478			499	
Approach Delay, s/veh		22.5			21.8			23.7			24.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	19.3	7.4	17.4	16.3	18.0	8.8	16.0
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	7.5	8.3	3.7	9.4	10.8	5.8	4.0	6.9
Green Ext Time (p_c), s	1.1	4.3	0.1	1.6	0.6	2.7	0.3	2.0

Intersection Summary	
HCM 6th Ctrl Delay	22.8
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	32	12	3	15	37	0	91	0	41	125	90
Future Volume (veh/h)	213	32	12	3	15	37	0	91	0	41	125	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	277	42	16	4	19	46	0	108	0	55	169	122
Peak Hour Factor	0.77	0.77	0.77	0.81	0.81	0.81	0.84	0.84	0.84	0.74	0.74	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	362	514	436	8	142	120	4	886	0	82	1695	526
Arrive On Green	0.20	0.27	0.27	0.00	0.08	0.08	0.00	0.17	0.00	0.05	0.33	0.33
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5274	0	1781	5106	1585
Grp Volume(v), veh/h	277	42	16	4	19	46	0	108	0	55	169	122
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	0	1781	1702	1585
Q Serve(g_s), s	5.8	0.7	0.3	0.1	0.4	1.1	0.0	0.7	0.0	1.2	0.9	2.2
Cycle Q Clear(g_c), s	5.8	0.7	0.3	0.1	0.4	1.1	0.0	0.7	0.0	1.2	0.9	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	362	514	436	8	142	120	4	886	0	82	1695	526
V/C Ratio(X)	0.76	0.08	0.04	0.52	0.13	0.38	0.00	0.12	0.00	0.67	0.10	0.23
Avail Cap(c_a), veh/h	893	1173	994	893	1173	994	893	3842	0	893	3842	1193
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.0	10.7	10.6	19.8	17.2	17.5	0.0	13.9	0.0	18.7	9.2	9.6
Incr Delay (d2), s/veh	3.4	0.1	0.0	44.5	0.4	2.0	0.0	0.2	0.0	9.3	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.2	0.1	0.1	0.2	0.4	0.0	0.2	0.0	0.6	0.2	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.3	10.8	10.6	64.3	17.6	19.5	0.0	14.1	0.0	28.0	9.3	10.4
LnGrp LOS	B	B	B	E	B	B	A	B	A	C	A	B
Approach Vol, veh/h		335			69			108			346	
Approach Delay, s/veh		17.0			21.6			14.1			12.7	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	16.0	0.0	19.2	12.6	8.0	6.3	12.9
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	2.7	0.0	4.2	7.8	3.1	3.2	2.7
Green Ext Time (p_c), s	0.0	0.2	0.0	3.6	0.7	0.2	0.1	1.3

Intersection Summary	
HCM 6th Ctrl Delay	15.3
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	400	37	126	299	76	39	119	235	156	105	49
Future Volume (veh/h)	28	400	37	126	299	76	39	119	235	156	105	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	455	42	152	360	92	50	153	301	284	191	89
Peak Hour Factor	0.88	0.88	0.88	0.83	0.83	0.83	0.78	0.78	0.78	0.55	0.55	0.55
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	58	767	70	194	843	376	77	429	364	333	450	210
Arrive On Green	0.03	0.16	0.16	0.11	0.24	0.24	0.04	0.23	0.23	0.19	0.37	0.37
Sat Flow, veh/h	1781	4762	434	1781	3554	1585	1781	1870	1585	1781	1207	562
Grp Volume(v), veh/h	32	324	173	152	360	92	50	153	301	284	0	280
Grp Sat Flow(s),veh/h/ln	1781	1702	1792	1781	1777	1585	1781	1870	1585	1781	0	1769
Q Serve(g_s), s	1.3	6.6	6.7	6.2	6.4	3.5	2.1	5.1	13.5	11.5	0.0	8.8
Cycle Q Clear(g_c), s	1.3	6.6	6.7	6.2	6.4	3.5	2.1	5.1	13.5	11.5	0.0	8.8
Prop In Lane	1.00		0.24	1.00		1.00	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	58	548	289	194	843	376	77	429	364	333	0	660
V/C Ratio(X)	0.55	0.59	0.60	0.78	0.43	0.24	0.65	0.36	0.83	0.85	0.00	0.42
Avail Cap(c_a), veh/h	478	2285	1203	478	2385	1064	478	753	638	478	0	712
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.5	29.0	29.0	32.3	24.1	23.0	35.1	24.1	27.3	29.3	0.0	17.4
Incr Delay (d2), s/veh	8.0	0.4	0.8	6.8	0.5	0.5	8.8	0.5	4.8	10.0	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	2.6	2.8	2.8	2.5	1.3	1.0	2.2	5.3	5.6	0.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.5	29.3	29.8	39.2	24.6	23.5	43.9	24.6	32.2	39.3	0.0	17.8
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	A	B
Approach Vol, veh/h		529			604			504			564	
Approach Delay, s/veh		30.3			28.1			31.0			28.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	18.0	8.8	34.3	7.7	23.7	19.5	23.6
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	8.2	8.7	4.1	10.8	3.3	8.4	13.5	15.5
Green Ext Time (p_c), s	0.3	2.1	0.1	1.5	0.0	3.9	0.5	1.6

Intersection Summary	
HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C

Notes
User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	0	1	50	121	1	19	35	80	116	34	113	0
Future Vol, veh/h	0	1	50	121	1	19	35	80	116	34	113	0
Peak Hour Factor	0.75	0.75	0.75	0.59	0.59	0.59	0.63	0.63	0.63	0.53	0.53	0.53
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	67	205	2	32	56	127	184	64	213	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.2	12.5	13.2	12.3
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	0%	86%	23%
Vol Thru, %	35%	2%	1%	77%
Vol Right, %	50%	98%	13%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	231	51	141	147
LT Vol	35	0	121	34
Through Vol	80	1	1	113
RT Vol	116	50	19	0
Lane Flow Rate	367	68	239	277
Geometry Grp	1	1	1	1
Degree of Util (X)	0.509	0.104	0.385	0.417
Departure Headway (Hd)	5.001	5.496	5.799	5.418
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	719	649	619	663
Service Time	3.043	3.557	3.845	3.464
HCM Lane V/C Ratio	0.51	0.105	0.386	0.418
HCM Control Delay	13.2	9.2	12.5	12.3
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	2.9	0.3	1.8	2.1

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	22	11	25	29	1
Future Vol, veh/h	0	22	11	25	29	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	42	42	56	56	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	52	20	45	46	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	65	0	-	0	95	43
Stage 1	-	-	-	-	43	-
Stage 2	-	-	-	-	52	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1537	-	-	-	905	1027
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	970	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1537	-	-	-	905	1027
Mov Cap-2 Maneuver	-	-	-	-	905	-
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	970	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1537	-	-	-	909
HCM Lane V/C Ratio	-	-	-	-	0.052
HCM Control Delay (s)	0	-	-	-	9.2
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	0.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	4	12	170	154	4
Future Vol, veh/h	6	4	12	170	154	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	64	64	61	61
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	8	19	266	252	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	560	256	259	0	-	0
Stage 1	256	-	-	-	-	-
Stage 2	304	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	489	783	1306	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	748	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	481	783	1306	-	-	-
Mov Cap-2 Maneuver	481	-	-	-	-	-
Stage 1	774	-	-	-	-	-
Stage 2	748	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1306	-	569	-	-
HCM Lane V/C Ratio	0.014	-	0.035	-	-
HCM Control Delay (s)	7.8	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	630	0	0	798	285	88	0	226	0	0	0
Future Volume (veh/h)	72	630	0	0	798	285	88	0	226	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	91	797	0	0	907	324	105	0	269			
Peak Hour Factor	0.79	0.79	0.79	0.88	0.88	0.88	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	120	2084	0	0	1184	421	128	0	328			
Arrive On Green	0.07	0.59	0.00	0.00	0.46	0.46	0.28	0.00	0.28			
Sat Flow, veh/h	1781	3647	0	0	2662	914	459	0	1176			
Grp Volume(v), veh/h	91	797	0	0	626	605	374	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1706	1636	0	0			
Q Serve(g_s), s	3.4	8.2	0.0	0.0	20.1	20.3	14.6	0.0	0.0			
Cycle Q Clear(g_c), s	3.4	8.2	0.0	0.0	20.1	20.3	14.6	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.54	0.28		0.72			
Lane Grp Cap(c), veh/h	120	2084	0	0	819	786	457	0	0			
V/C Ratio(X)	0.76	0.38	0.00	0.00	0.76	0.77	0.82	0.00	0.00			
Avail Cap(c_a), veh/h	520	3062	0	0	908	872	836	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	31.4	7.5	0.0	0.0	15.4	15.4	23.1	0.0	0.0			
Incr Delay (d2), s/veh	9.4	0.2	0.0	0.0	4.4	4.7	4.4	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.7	2.5	0.0	0.0	7.9	7.7	5.5	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.8	7.8	0.0	0.0	19.8	20.1	27.5	0.0	0.0			
LnGrp LOS	D	A	A	A	B	C	C	A	A			
Approach Vol, veh/h		888			1231			374				
Approach Delay, s/veh		11.2			19.9			27.5				
Approach LOS		B			B			C				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		44.8			8.6	36.2		23.7				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0				
Max Q Clear Time (g_c+I1), s		10.2			5.4	22.3		16.6				
Green Ext Time (p_c), s		12.5			0.2	9.3		2.5				
Intersection Summary												
HCM 6th Ctrl Delay			17.9									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	462	93	293	593	0	0	0	0	240	4	104
Future Volume (veh/h)	0	462	93	293	593	0	0	0	0	240	4	104
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	679	137	337	682	0				267	4	116
Peak Hour Factor	0.68	0.68	0.68	0.87	0.87	0.87				0.90	0.90	0.90
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1303	260	391	1094	0				329	5	143
Arrive On Green	0.00	0.31	0.31	0.22	0.58	0.00				0.28	0.28	0.28
Sat Flow, veh/h	0	4439	851	1781	1870	0				1186	18	515
Grp Volume(v), veh/h	0	539	277	337	682	0				387	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1717	1781	1870	0				1718	0	0
Q Serve(g_s), s	0.0	8.7	8.9	12.2	15.9	0.0				14.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	8.7	8.9	12.2	15.9	0.0				14.0	0.0	0.0
Prop In Lane	0.00		0.50	1.00		0.00				0.69		0.30
Lane Grp Cap(c), veh/h	0	1039	524	391	1094	0				477	0	0
V/C Ratio(X)	0.00	0.52	0.53	0.86	0.62	0.00				0.81	0.00	0.00
Avail Cap(c_a), veh/h	0	1783	899	533	1651	0				900	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	19.2	19.2	25.1	9.1	0.0				22.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.8	1.6	10.4	1.1	0.0				4.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.3	3.5	5.9	5.3	0.0				5.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	20.0	20.8	35.5	10.2	0.0				26.5	0.0	0.0
LnGrp LOS	A	B	C	D	B	A				C	A	A
Approach Vol, veh/h		816			1019						387	
Approach Delay, s/veh		20.3			18.6						26.5	
Approach LOS		C			B						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.7	25.0		23.2		43.7						
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6						
Max Green Setting (Gmax), s	20.0	35.0		35.0		59.0						
Max Q Clear Time (g_c+I1), s	14.2	10.9		16.0		17.9						
Green Ext Time (p_c), s	0.5	9.5		2.5		10.5						

Intersection Summary		
HCM 6th Ctrl Delay		20.6
HCM 6th LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	571	0	0	551	229	212	4	276	0	0	0
Future Volume (veh/h)	259	571	0	0	551	229	212	4	276	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	276	607	0	0	586	0	252	5	329			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	347	1934	0	0	964		476	9	431			
Arrive On Green	0.19	0.54	0.00	0.00	0.27	0.00	0.27	0.27	0.27			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1748	35	1585			
Grp Volume(v), veh/h	276	607	0	0	586	0	257	0	329			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1783	0	1585			
Q Serve(g_s), s	8.0	5.1	0.0	0.0	7.7	0.0	6.6	0.0	10.3			
Cycle Q Clear(g_c), s	8.0	5.1	0.0	0.0	7.7	0.0	6.6	0.0	10.3			
Prop In Lane	1.00		0.00	0.00		1.00	0.98		1.00			
Lane Grp Cap(c), veh/h	347	1934	0	0	964		485	0	431			
V/C Ratio(X)	0.80	0.31	0.00	0.00	0.61		0.53	0.00	0.76			
Avail Cap(c_a), veh/h	661	3576	0	0	1979		1026	0	912			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	20.7	6.7	0.0	0.0	17.1	0.0	16.7	0.0	18.0			
Incr Delay (d2), s/veh	5.0	0.1	0.0	0.0	0.9	0.0	0.9	0.0	2.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.2	1.2	0.0	0.0	2.7	0.0	2.3	0.0	3.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.6	6.9	0.0	0.0	18.0	0.0	17.6	0.0	20.8			
LnGrp LOS	C	A	A	A	B		B	A	C			
Approach Vol, veh/h		883			586			586				
Approach Delay, s/veh		12.7			18.0			19.4				
Approach LOS		B			B			B				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		34.6			14.7	19.9		19.3				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		7.1			10.0	9.7		12.3				
Green Ext Time (p_c), s		6.2			0.7	4.9		2.4				

Intersection Summary			
HCM 6th Ctrl Delay			16.1
HCM 6th LOS			B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	552	291	258	505	0	0	0	0	278	6	190
Future Volume (veh/h)	0	552	291	258	505	0	0	0	0	278	6	190
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	594	313	284	555	0				282	76	226
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91				0.84	0.84	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1404	436	348	1028	0				470	110	326
Arrive On Green	0.00	0.28	0.28	0.20	0.55	0.00				0.26	0.26	0.26
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	415	1234
Grp Volume(v), veh/h	0	594	313	284	555	0				282	0	302
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1648
Q Serve(g_s), s	0.0	5.1	9.5	8.1	10.1	0.0				7.3	0.0	8.8
Cycle Q Clear(g_c), s	0.0	5.1	9.5	8.1	10.1	0.0				7.3	0.0	8.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.75
Lane Grp Cap(c), veh/h	0	1404	436	348	1028	0				470	0	435
V/C Ratio(X)	0.00	0.42	0.72	0.82	0.54	0.00				0.60	0.00	0.69
Avail Cap(c_a), veh/h	0	1924	597	436	1311	0				1175	0	1087
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.8	17.4	20.4	7.7	0.0				17.1	0.0	17.6
Incr Delay (d2), s/veh	0.0	0.2	2.6	11.3	0.4	0.0				1.5	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.6	3.1	3.9	2.6	0.0				2.6	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	16.0	20.0	31.8	8.1	0.0				18.6	0.0	20.0
LnGrp LOS	A	B	B	C	A	A				B	A	C
Approach Vol, veh/h		907			839						584	
Approach Delay, s/veh		17.4			16.1						19.3	
Approach LOS		B			B						B	

Timer - Assigned Phs	1	2	4	6
Phs Duration (G+Y+Rc), s	14.6	19.9	18.6	34.5
Change Period (Y+Rc), s	* 4.2	5.3	4.6	5.3
Max Green Setting (Gmax), s	* 13	20.0	35.0	37.2
Max Q Clear Time (g_c+I1), s	10.1	11.5	10.8	12.1
Green Ext Time (p_c), s	0.4	3.1	3.3	3.4

Intersection Summary	
HCM 6th Ctrl Delay	17.4
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	319	34	284	289	120	461
Future Volume (veh/h)	319	34	284	289	120	461
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	560	60	355	361	143	549
Peak Hour Factor	0.57	0.57	0.80	0.80	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	954	426	547	1857	490	768
Arrive On Green	0.27	0.27	0.16	0.52	0.28	0.28
Sat Flow, veh/h	3647	1585	3456	3647	1781	2790
Grp Volume(v), veh/h	560	60	355	361	143	549
Grp Sat Flow(s),veh/h/ln	1777	1585	1728	1777	1781	1395
Q Serve(g_s), s	6.6	1.4	4.6	2.6	3.0	8.5
Cycle Q Clear(g_c), s	6.6	1.4	4.6	2.6	3.0	8.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	954	426	547	1857	490	768
V/C Ratio(X)	0.59	0.14	0.65	0.19	0.29	0.72
Avail Cap(c_a), veh/h	3704	1652	1441	5526	1901	2977
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.2	13.3	18.9	6.1	13.7	15.7
Incr Delay (d2), s/veh	0.6	0.1	1.3	0.1	0.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.4	1.7	0.7	1.0	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.8	13.5	20.3	6.1	14.0	16.9
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	620			716	692	
Approach Delay, s/veh	15.6			13.1	16.3	
Approach LOS	B			B	B	

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	12.2	18.0				30.2		17.8
Change Period (Y+Rc), s	4.6	5.1				5.1		4.6
Max Green Setting (Gmax), s	20.0	50.0				74.6		51.2
Max Q Clear Time (g_c+I1), s	6.6	8.6				4.6		10.5
Green Ext Time (p_c), s	1.0	4.3				2.5		2.7

Intersection Summary			
HCM 6th Ctrl Delay			15.0
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	142	0	0	2	63	542	0	3	346	5
Future Volume (veh/h)	8	0	142	0	0	2	63	542	0	3	346	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	14	0	245	0	0	4	74	638	0	5	532	8
Peak Hour Factor	0.58	0.58	0.58	0.50	0.50	0.50	0.85	0.85	0.85	0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	45	0	384	5	0	153	178	1799	0	17	1358	20
Arrive On Green	0.03	0.00	0.24	0.00	0.00	0.10	0.10	0.35	0.00	0.01	0.26	0.26
Sat Flow, veh/h	1781	0	1585	1781	0	1585	1781	5274	0	1781	5183	78
Grp Volume(v), veh/h	14	0	245	0	0	4	74	638	0	5	349	191
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1585	1781	1702	0	1781	1702	1856
Q Serve(g_s), s	0.3	0.0	5.3	0.0	0.0	0.1	1.5	3.5	0.0	0.1	3.2	3.2
Cycle Q Clear(g_c), s	0.3	0.0	5.3	0.0	0.0	0.1	1.5	3.5	0.0	0.1	3.2	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.04
Lane Grp Cap(c), veh/h	45	0	384	5	0	153	178	1799	0	17	892	486
V/C Ratio(X)	0.31	0.00	0.64	0.00	0.00	0.03	0.42	0.35	0.00	0.30	0.39	0.39
Avail Cap(c_a), veh/h	467	0	1454	467	0	1454	934	4683	0	467	2230	1216
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	0.0	12.9	0.0	0.0	15.6	16.1	9.1	0.0	18.8	11.6	11.6
Incr Delay (d2), s/veh	3.8	0.0	2.5	0.0	0.0	0.1	1.6	0.2	0.0	9.4	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	1.8	0.0	0.0	0.0	0.5	0.8	0.0	0.1	0.8	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.1	0.0	15.4	0.0	0.0	15.7	17.7	9.3	0.0	28.2	12.0	12.3
LnGrp LOS	C	A	B	A	A	B	B	A	A	C	B	B
Approach Vol, veh/h		259			4			712			545	
Approach Delay, s/veh		15.8			15.7			10.2			12.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	14.0	8.4	15.8	5.6	8.4	5.0	19.2
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	0.0	7.3	3.5	5.2	2.3	2.1	2.1	5.5
Green Ext Time (p_c), s	0.0	2.4	0.1	4.0	0.0	0.0	0.0	5.9

Intersection Summary	
HCM 6th Ctrl Delay	11.9
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	347	559	69	350	350	101	77	208	182	124	143	228
Future Volume (veh/h)	347	559	69	350	350	101	77	208	182	124	143	228
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	413	665	82	407	407	117	87	234	204	188	217	345
Peak Hour Factor	0.84	0.84	0.84	0.86	0.86	0.86	0.89	0.89	0.89	0.66	0.66	0.66
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	458	1299	403	529	768	238	114	1226	670	287	1322	410
Arrive On Green	0.26	0.25	0.25	0.15	0.15	0.15	0.06	0.24	0.24	0.08	0.26	0.26
Sat Flow, veh/h	1781	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	413	665	82	407	407	117	87	234	204	188	217	345
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	17.9	8.9	3.2	9.0	5.9	5.4	3.8	2.9	4.8	4.2	2.6	16.5
Cycle Q Clear(g_c), s	17.9	8.9	3.2	9.0	5.9	5.4	3.8	2.9	4.8	4.2	2.6	16.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	458	1299	403	529	768	238	114	1226	670	287	1322	410
V/C Ratio(X)	0.90	0.51	0.20	0.77	0.53	0.49	0.76	0.19	0.30	0.66	0.16	0.84
Avail Cap(c_a), veh/h	558	2560	795	1083	2560	795	558	2240	1224	1083	2240	695
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	25.5	23.4	32.4	31.3	31.1	36.7	24.1	24.9	35.5	22.9	28.0
Incr Delay (d2), s/veh	15.8	0.3	0.2	2.4	0.6	1.6	9.9	0.1	0.3	2.5	0.1	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	3.3	1.1	3.7	2.3	2.0	1.9	1.1	1.5	1.7	1.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.4	25.8	23.6	34.8	31.9	32.7	46.6	24.2	25.1	38.0	22.9	32.7
LnGrp LOS	D	C	C	C	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1160			931			525			750	
Approach Delay, s/veh		32.3			33.3			28.3			31.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.2	26.3	9.6	26.7	25.5	18.0	11.1	25.2
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	11.0	10.9	5.8	18.5	19.9	7.9	6.2	6.8
Green Ext Time (p_c), s	1.2	4.7	0.2	2.2	0.6	3.0	0.5	2.2

Intersection Summary		
HCM 6th Ctrl Delay		31.7
HCM 6th LOS		C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	9	7	2	24	16	1	74	0	42	112	113
Future Volume (veh/h)	107	9	7	2	24	16	1	74	0	42	112	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	126	11	8	4	48	32	1	95	0	58	153	155
Peak Hour Factor	0.85	0.85	0.85	0.50	0.50	0.50	0.78	0.78	0.78	0.73	0.73	0.73
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	168	305	258	8	136	116	5	1020	0	88	1267	393
Arrive On Green	0.09	0.16	0.16	0.00	0.07	0.07	0.00	0.20	0.00	0.05	0.25	0.25
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5274	0	1781	5106	1585
Grp Volume(v), veh/h	126	11	8	4	48	32	1	95	0	58	153	155
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	0	1781	1702	1585
Q Serve(g_s), s	2.4	0.2	0.1	0.1	0.8	0.7	0.0	0.5	0.0	1.1	0.8	2.8
Cycle Q Clear(g_c), s	2.4	0.2	0.1	0.1	0.8	0.7	0.0	0.5	0.0	1.1	0.8	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	168	305	258	8	136	116	5	1020	0	88	1267	393
V/C Ratio(X)	0.75	0.04	0.03	0.51	0.35	0.28	0.19	0.09	0.00	0.66	0.12	0.39
Avail Cap(c_a), veh/h	1039	1364	1156	1039	1364	1156	1039	4468	0	1039	4468	1387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.1	12.1	12.1	17.0	15.1	15.0	17.1	11.2	0.0	16.0	10.0	10.7
Incr Delay (d2), s/veh	6.5	0.0	0.0	44.2	1.5	1.3	17.0	0.1	0.0	8.0	0.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.1	0.0	0.1	0.4	0.2	0.0	0.1	0.0	0.5	0.2	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.7	12.1	12.1	61.2	16.7	16.3	34.1	11.3	0.0	24.1	10.1	13.1
LnGrp LOS	C	B	B	E	B	B	C	B	A	C	B	B
Approach Vol, veh/h		145			84			96			366	
Approach Delay, s/veh		20.4			18.7			11.6			13.6	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	10.6	4.5	14.5	7.7	7.5	6.2	12.9
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	2.2	2.0	4.8	4.4	2.8	3.1	2.5
Green Ext Time (p_c), s	0.0	0.0	0.0	3.7	0.3	0.3	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	638	48	217	278	155	12	25	207	130	31	11
Future Volume (veh/h)	40	638	48	217	278	155	12	25	207	130	31	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	874	66	231	296	165	13	27	223	171	41	14
Peak Hour Factor	0.73	0.73	0.73	0.94	0.94	0.94	0.93	0.93	0.93	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	1204	91	277	1277	570	28	321	272	214	368	126
Arrive On Green	0.04	0.25	0.25	0.16	0.36	0.36	0.02	0.17	0.17	0.12	0.28	0.28
Sat Flow, veh/h	1781	4844	365	1781	3554	1585	1781	1870	1585	1781	1333	455
Grp Volume(v), veh/h	55	613	327	231	296	165	13	27	223	171	0	55
Grp Sat Flow(s),veh/h/ln	1781	1702	1805	1781	1777	1585	1781	1870	1585	1781	0	1788
Q Serve(g_s), s	2.3	12.7	12.8	9.7	4.5	5.7	0.6	0.9	10.4	7.2	0.0	1.8
Cycle Q Clear(g_c), s	2.3	12.7	12.8	9.7	4.5	5.7	0.6	0.9	10.4	7.2	0.0	1.8
Prop In Lane	1.00		0.20	1.00		1.00	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	80	846	449	277	1277	570	28	321	272	214	0	494
V/C Ratio(X)	0.69	0.72	0.73	0.83	0.23	0.29	0.46	0.08	0.82	0.80	0.00	0.11
Avail Cap(c_a), veh/h	463	2211	1172	463	2308	1029	463	729	618	463	0	697
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.2	26.5	26.5	31.5	17.2	17.6	37.6	26.8	30.8	33.0	0.0	20.8
Incr Delay (d2), s/veh	10.0	0.4	0.9	6.4	0.1	0.4	11.4	0.1	6.1	6.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.9	5.3	4.3	1.7	2.0	0.3	0.4	4.3	3.4	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	27.0	27.4	38.0	17.4	18.0	49.0	26.9	36.8	39.6	0.0	20.9
LnGrp LOS	D	C	C	D	B	B	D	C	D	D	A	C
Approach Vol, veh/h		995			692			263			226	
Approach Delay, s/veh		28.2			24.4			36.4			35.1	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	25.1	6.8	27.8	8.8	33.7	14.9	19.7
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	11.7	14.8	2.6	3.8	4.3	7.7	9.2	12.4
Green Ext Time (p_c), s	0.4	4.4	0.0	0.2	0.1	3.7	0.3	0.8

Intersection Summary	
HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	4	42	106	7	26	34	59	82	23	37	0
Future Vol, veh/h	0	4	42	106	7	26	34	59	82	23	37	0
Peak Hour Factor	0.61	0.61	0.61	0.54	0.54	0.54	0.75	0.75	0.75	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	69	196	13	48	45	79	109	28	45	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	10.3	9.6	8.7
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	0%	76%	38%
Vol Thru, %	34%	9%	5%	62%
Vol Right, %	47%	91%	19%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	175	46	139	60
LT Vol	34	0	106	23
Through Vol	59	4	7	37
RT Vol	82	42	26	0
Lane Flow Rate	233	75	257	72
Geometry Grp	1	1	1	1
Degree of Util (X)	0.297	0.093	0.342	0.102
Departure Headway (Hd)	4.578	4.433	4.781	5.091
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	782	802	749	700
Service Time	2.628	2.496	2.832	3.155
HCM Lane V/C Ratio	0.298	0.094	0.343	0.103
HCM Control Delay	9.6	8	10.3	8.7
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	1.2	0.3	1.5	0.3

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	22	10	24	25	3
Future Vol, veh/h	0	22	10	24	25	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	50	71	71	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	44	14	34	28	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	48	0	-	0	75	31
Stage 1	-	-	-	-	31	-
Stage 2	-	-	-	-	44	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1559	-	-	-	928	1043
Stage 1	-	-	-	-	992	-
Stage 2	-	-	-	-	978	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1559	-	-	-	928	1043
Mov Cap-2 Maneuver	-	-	-	-	928	-
Stage 1	-	-	-	-	992	-
Stage 2	-	-	-	-	978	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1559	-	-	-	939
HCM Lane V/C Ratio	-	-	-	-	0.034
HCM Control Delay (s)	0	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	8	11	131	158	5
Future Vol, veh/h	8	8	11	131	158	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	57	57	75	75	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	14	15	175	298	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	508	303	307	0	-	0
Stage 1	303	-	-	-	-	-
Stage 2	205	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	525	737	1254	-	-	-
Stage 1	749	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	518	737	1254	-	-	-
Mov Cap-2 Maneuver	518	-	-	-	-	-
Stage 1	739	-	-	-	-	-
Stage 2	829	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1254	-	608	-	-
HCM Lane V/C Ratio	0.012	-	0.046	-	-
HCM Control Delay (s)	7.9	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	797	0	0	711	248	64	5	398	0	0	0
Future Volume (veh/h)	104	797	0	0	711	248	64	5	398	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	135	1035	0	0	799	279	76	6	474			
Peak Hour Factor	0.77	0.77	0.77	0.89	0.89	0.89	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	171	1846	0	0	973	339	82	6	513			
Arrive On Green	0.10	0.52	0.00	0.00	0.38	0.38	0.37	0.37	0.37			
Sat Flow, veh/h	1781	3647	0	0	2677	901	220	17	1374			
Grp Volume(v), veh/h	135	1035	0	0	549	529	556	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1708	1612	0	0			
Q Serve(g_s), s	6.4	16.9	0.0	0.0	23.9	24.0	28.3	0.0	0.0			
Cycle Q Clear(g_c), s	6.4	16.9	0.0	0.0	23.9	24.0	28.3	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.53	0.14		0.85			
Lane Grp Cap(c), veh/h	171	1846	0	0	669	643	602	0	0			
V/C Ratio(X)	0.79	0.56	0.00	0.00	0.82	0.82	0.92	0.00	0.00			
Avail Cap(c_a), veh/h	416	2446	0	0	725	697	658	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	37.9	14.0	0.0	0.0	24.1	24.1	25.7	0.0	0.0			
Incr Delay (d2), s/veh	7.8	0.5	0.0	0.0	8.1	8.4	18.3	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.1	6.2	0.0	0.0	10.8	10.5	12.7	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.7	14.5	0.0	0.0	32.2	32.6	44.0	0.0	0.0			
LnGrp LOS	D	B	A	A	C	C	D	A	A			
Approach Vol, veh/h		1170			1078			556				
Approach Delay, s/veh		18.1			32.4			44.0				
Approach LOS		B			C			D				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		49.1			12.2	36.9		36.6				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0				
Max Q Clear Time (g_c+I1), s		18.9			8.4	26.0		30.3				
Green Ext Time (p_c), s		16.7			0.2	6.3		1.7				

Intersection Summary	
HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	574	72	225	550	0	0	0	0	327	8	105
Future Volume (veh/h)	0	574	72	225	550	0	0	0	0	327	8	105
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	786	99	253	618	0				376	9	121
Peak Hour Factor	0.73	0.73	0.73	0.89	0.89	0.89				0.87	0.87	0.87
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1415	177	303	997	0				438	10	141
Arrive On Green	0.00	0.31	0.31	0.17	0.53	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	4764	575	1781	1870	0				1287	31	414
Grp Volume(v), veh/h	0	581	304	253	618	0				506	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1767	1781	1870	0				1731	0	0
Q Serve(g_s), s	0.0	10.4	10.5	10.0	16.8	0.0				19.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.4	10.5	10.0	16.8	0.0				19.8	0.0	0.0
Prop In Lane	0.00		0.33	1.00		0.00				0.74		0.24
Lane Grp Cap(c), veh/h	0	1048	544	303	997	0				590	0	0
V/C Ratio(X)	0.00	0.55	0.56	0.84	0.62	0.00				0.86	0.00	0.00
Avail Cap(c_a), veh/h	0	1636	849	489	1516	0				832	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	21.0	21.1	29.2	11.9	0.0				22.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	1.8	6.7	1.2	0.0				7.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	4.3	4.6	6.2	0.0				8.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	21.9	22.8	36.0	13.1	0.0				29.3	0.0	0.0
LnGrp LOS	A	C	C	D	B	A				C	A	A
Approach Vol, veh/h		885			871						506	
Approach Delay, s/veh		22.2			19.7						29.3	
Approach LOS		C			B						C	

Timer - Assigned Phs	1	2	4	6
Phs Duration (G+Y+Rc), s	16.4	27.0	29.4	43.4
Change Period (Y+Rc), s	4.0	4.6	4.6	4.6
Max Green Setting (Gmax), s	20.0	35.0	35.0	59.0
Max Q Clear Time (g_c+I1), s	12.0	12.5	21.8	18.8
Green Ext Time (p_c), s	0.4	9.9	3.0	9.0

Intersection Summary	
HCM 6th Ctrl Delay	22.9
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	763	0	0	600	434	246	6	432	0	0	0
Future Volume (veh/h)	212	763	0	0	600	434	246	6	432	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	228	820	0	0	625	0	256	6	450			
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	288	1780	0	0	961		588	14	535			
Arrive On Green	0.16	0.50	0.00	0.00	0.27	0.00	0.34	0.34	0.34			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1742	41	1585			
Grp Volume(v), veh/h	228	820	0	0	625	0	262	0	450			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1783	0	1585			
Q Serve(g_s), s	7.5	9.2	0.0	0.0	9.5	0.0	7.0	0.0	16.1			
Cycle Q Clear(g_c), s	7.5	9.2	0.0	0.0	9.5	0.0	7.0	0.0	16.1			
Prop In Lane	1.00		0.00	0.00		1.00	0.98		1.00			
Lane Grp Cap(c), veh/h	288	1780	0	0	961		602	0	535			
V/C Ratio(X)	0.79	0.46	0.00	0.00	0.65		0.44	0.00	0.84			
Avail Cap(c_a), veh/h	582	3148	0	0	1742		904	0	803			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.7	9.9	0.0	0.0	19.8	0.0	15.7	0.0	18.8			
Incr Delay (d2), s/veh	5.8	0.3	0.0	0.0	1.1	0.0	0.5	0.0	5.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.3	2.7	0.0	0.0	3.5	0.0	2.4	0.0	5.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	10.2	0.0	0.0	20.8	0.0	16.2	0.0	23.9			
LnGrp LOS	C	B	A	A	C		B	A	C			
Approach Vol, veh/h		1048			625			712				
Approach Delay, s/veh		14.6			20.8			21.1				
Approach LOS		B			C			C				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		35.9			14.1	21.9		25.2				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		11.2			9.5	11.5		18.1				
Green Ext Time (p_c), s		9.1			0.6	5.0		2.6				

Intersection Summary			
HCM 6th Ctrl Delay			18.2
HCM 6th LOS			B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	689	273	239	607	0	0	0	0	286	1	202
Future Volume (veh/h)	0	689	273	239	607	0	0	0	0	286	1	202
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	749	297	252	639	0				330	79	273
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95				0.74	0.74	0.74
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1387	431	313	979	0				530	110	379
Arrive On Green	0.00	0.27	0.27	0.18	0.52	0.00				0.30	0.30	0.30
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	368	1273
Grp Volume(v), veh/h	0	749	297	252	639	0				330	0	352
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1641
Q Serve(g_s), s	0.0	6.9	9.3	7.5	13.7	0.0				8.8	0.0	10.6
Cycle Q Clear(g_c), s	0.0	6.9	9.3	7.5	13.7	0.0				8.8	0.0	10.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.78
Lane Grp Cap(c), veh/h	0	1387	431	313	979	0				530	0	488
V/C Ratio(X)	0.00	0.54	0.69	0.80	0.65	0.00				0.62	0.00	0.72
Avail Cap(c_a), veh/h	0	1846	573	419	1258	0				1127	0	1038
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.2	18.1	21.9	9.5	0.0				16.8	0.0	17.4
Incr Delay (d2), s/veh	0.0	0.3	2.2	10.5	0.8	0.0				1.5	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.3	3.0	3.6	3.9	0.0				3.1	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.5	20.3	32.4	10.3	0.0				18.2	0.0	19.8
LnGrp LOS	A	B	C	C	B	A				B	A	B
Approach Vol, veh/h		1046			891						682	
Approach Delay, s/veh		18.3			16.6						19.0	
Approach LOS		B			B						B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	13.9	20.3		21.1		34.3
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3
Max Green Setting (Gmax), s	* 13	20.0		35.0		37.2
Max Q Clear Time (g_c+I1), s	9.5	11.3		12.6		15.7
Green Ext Time (p_c), s	0.4	3.7		3.8		3.9

Intersection Summary	
HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix E – 2022 Existing Conditions plus Project Level of Service Sheets

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	427	43	207	416	209	222
Future Volume (veh/h)	427	43	207	416	209	222
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	667	67	230	462	279	296
Peak Hour Factor	0.64	0.64	0.90	0.90	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1125	502	497	1991	408	639
Arrive On Green	0.32	0.32	0.14	0.56	0.23	0.23
Sat Flow, veh/h	3647	1585	3456	3647	1781	2790
Grp Volume(v), veh/h	667	67	230	462	279	296
Grp Sat Flow(s),veh/h/ln	1777	1585	1728	1777	1781	1395
Q Serve(g_s), s	7.3	1.4	2.8	3.0	6.6	4.2
Cycle Q Clear(g_c), s	7.3	1.4	2.8	3.0	6.6	4.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1125	502	497	1991	408	639
V/C Ratio(X)	0.59	0.13	0.46	0.23	0.68	0.46
Avail Cap(c_a), veh/h	3855	1719	1500	5752	1979	3099
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.2	11.2	18.1	5.1	16.2	15.3
Incr Delay (d2), s/veh	0.5	0.1	0.7	0.1	2.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.4	1.0	0.7	2.2	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.7	11.4	18.8	5.2	18.3	15.8
LnGrp LOS	B	B	B	A	B	B
Approach Vol, veh/h	734			692	575	
Approach Delay, s/veh	13.5			9.7	17.0	
Approach LOS	B			A	B	

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	11.2	19.7	30.9	15.2
Change Period (Y+Rc), s	4.6	5.1	5.1	4.6
Max Green Setting (Gmax), s	20.0	50.0	74.6	51.2
Max Q Clear Time (g_c+I1), s	4.8	9.3	5.0	8.6
Green Ext Time (p_c), s	0.6	5.3	3.4	2.0

Intersection Summary	
HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	0	152	1	0	3	65	455	0	3	225	24
Future Volume (veh/h)	43	0	152	1	0	3	65	455	0	3	225	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	73	0	258	2	0	6	87	607	0	4	331	35
Peak Hour Factor	0.59	0.59	0.59	0.50	0.50	0.50	0.75	0.75	0.75	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	165	0	378	7	0	237	183	1612	0	14	1037	108
Arrive On Green	0.09	0.00	0.24	0.00	0.00	0.15	0.10	0.32	0.00	0.01	0.22	0.22
Sat Flow, veh/h	1781	0	1585	1781	0	1585	1781	5274	0	1781	4699	487
Grp Volume(v), veh/h	73	0	258	2	0	6	87	607	0	4	238	128
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1585	1781	1702	0	1781	1702	1783
Q Serve(g_s), s	1.8	0.0	6.7	0.1	0.0	0.1	2.1	4.2	0.0	0.1	2.7	2.7
Cycle Q Clear(g_c), s	1.8	0.0	6.7	0.1	0.0	0.1	2.1	4.2	0.0	0.1	2.7	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.27
Lane Grp Cap(c), veh/h	165	0	378	7	0	237	183	1612	0	14	751	393
V/C Ratio(X)	0.44	0.00	0.68	0.29	0.00	0.03	0.48	0.38	0.00	0.30	0.32	0.33
Avail Cap(c_a), veh/h	393	0	1224	393	0	1224	786	3942	0	393	1877	983
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	0.0	15.7	22.5	0.0	16.5	19.2	12.0	0.0	22.4	14.8	14.8
Incr Delay (d2), s/veh	1.8	0.0	3.1	22.0	0.0	0.1	1.9	0.2	0.0	11.7	0.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	2.5	0.1	0.0	0.1	0.8	1.1	0.0	0.1	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.3	0.0	18.8	44.5	0.0	16.5	21.1	12.3	0.0	34.0	15.1	15.5
LnGrp LOS	C	A	B	D	A	B	C	B	A	C	B	B
Approach Vol, veh/h		331			8			694			370	
Approach Delay, s/veh		19.4			23.5			13.4			15.5	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	15.5	9.3	15.8	8.8	11.5	4.9	20.1
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	2.1	8.7	4.1	4.7	3.8	2.1	2.1	6.2
Green Ext Time (p_c), s	0.0	2.5	0.1	2.7	0.1	0.0	0.0	5.6

Intersection Summary	
HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	857	29	292	433	82	43	145	208	79	109	141
Future Volume (veh/h)	235	857	29	292	433	82	43	145	208	79	109	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	276	1008	34	348	515	98	52	175	251	120	165	214
Peak Hour Factor	0.85	0.85	0.85	0.84	0.84	0.84	0.83	0.83	0.83	0.66	0.66	0.66
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	333	1570	488	510	1370	425	82	821	448	229	923	287
Arrive On Green	0.19	0.31	0.31	0.15	0.27	0.27	0.05	0.16	0.16	0.07	0.18	0.18
Sat Flow, veh/h	1781	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	276	1008	34	348	515	98	52	175	251	120	165	214
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	10.1	11.5	1.0	6.5	5.6	3.3	1.9	2.0	5.6	2.3	1.9	8.6
Cycle Q Clear(g_c), s	10.1	11.5	1.0	6.5	5.6	3.3	1.9	2.0	5.6	2.3	1.9	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	333	1570	488	510	1370	425	82	821	448	229	923	287
V/C Ratio(X)	0.83	0.64	0.07	0.68	0.38	0.23	0.63	0.21	0.56	0.52	0.18	0.75
Avail Cap(c_a), veh/h	658	3020	937	1277	3020	937	658	2642	1444	1277	2642	820
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.5	20.2	16.6	27.3	20.1	19.3	31.7	24.7	26.2	30.6	23.5	26.2
Incr Delay (d2), s/veh	5.3	0.4	0.1	1.6	0.2	0.3	7.8	0.1	1.1	1.9	0.1	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	4.0	0.3	2.5	2.0	1.1	0.9	0.7	1.7	0.9	0.7	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	20.6	16.6	28.9	20.3	19.6	39.5	24.8	27.3	32.4	23.5	30.1
LnGrp LOS	C	C	B	C	C	B	D	C	C	C	C	C
Approach Vol, veh/h		1318			961			478			499	
Approach Delay, s/veh		22.9			23.4			27.7			28.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	26.8	7.6	18.2	17.6	24.2	9.0	16.9
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	8.5	13.5	3.9	10.6	12.1	7.6	4.3	7.6
Green Ext Time (p_c), s	1.1	7.3	0.1	1.6	0.6	3.7	0.3	2.0

Intersection Summary	
HCM 6th Ctrl Delay	24.6
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	32	12	3	15	37	0	91	0	41	125	90
Future Volume (veh/h)	213	32	12	3	15	37	0	91	0	41	125	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	277	42	16	4	19	46	0	108	0	55	169	122
Peak Hour Factor	0.77	0.77	0.77	0.81	0.81	0.81	0.84	0.84	0.84	0.74	0.74	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	362	514	436	8	142	120	4	886	0	82	1695	526
Arrive On Green	0.20	0.27	0.27	0.00	0.08	0.08	0.00	0.17	0.00	0.05	0.33	0.33
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5274	0	1781	5106	1585
Grp Volume(v), veh/h	277	42	16	4	19	46	0	108	0	55	169	122
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	0	1781	1702	1585
Q Serve(g_s), s	5.8	0.7	0.3	0.1	0.4	1.1	0.0	0.7	0.0	1.2	0.9	2.2
Cycle Q Clear(g_c), s	5.8	0.7	0.3	0.1	0.4	1.1	0.0	0.7	0.0	1.2	0.9	2.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	362	514	436	8	142	120	4	886	0	82	1695	526
V/C Ratio(X)	0.76	0.08	0.04	0.52	0.13	0.38	0.00	0.12	0.00	0.67	0.10	0.23
Avail Cap(c_a), veh/h	893	1173	994	893	1173	994	893	3842	0	893	3842	1193
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.0	10.7	10.6	19.8	17.2	17.5	0.0	13.9	0.0	18.7	9.2	9.6
Incr Delay (d2), s/veh	3.4	0.1	0.0	44.5	0.4	2.0	0.0	0.2	0.0	9.3	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.2	0.1	0.1	0.2	0.4	0.0	0.2	0.0	0.6	0.2	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.3	10.8	10.6	64.3	17.6	19.5	0.0	14.1	0.0	28.0	9.3	10.4
LnGrp LOS	B	B	B	E	B	B	A	B	A	C	A	B
Approach Vol, veh/h		335			69			108			346	
Approach Delay, s/veh		17.0			21.6			14.1			12.7	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	16.0	0.0	19.2	12.6	8.0	6.3	12.9
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	2.7	0.0	4.2	7.8	3.1	3.2	2.7
Green Ext Time (p_c), s	0.0	0.2	0.0	3.6	0.7	0.2	0.1	1.3

Intersection Summary	
HCM 6th Ctrl Delay	15.3
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	730	37	126	415	76	39	119	235	156	105	49
Future Volume (veh/h)	28	730	37	126	415	76	39	119	235	156	105	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	830	42	152	500	92	50	153	301	284	191	89
Peak Hour Factor	0.88	0.88	0.88	0.83	0.83	0.83	0.78	0.78	0.78	0.55	0.55	0.55
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	55	1112	56	190	1063	474	71	416	352	324	439	205
Arrive On Green	0.03	0.22	0.22	0.11	0.30	0.30	0.04	0.22	0.22	0.18	0.36	0.36
Sat Flow, veh/h	1781	4978	251	1781	3554	1585	1781	1870	1585	1781	1207	562
Grp Volume(v), veh/h	32	567	305	152	500	92	50	153	301	284	0	280
Grp Sat Flow(s),veh/h/ln	1781	1702	1825	1781	1777	1585	1781	1870	1585	1781	0	1769
Q Serve(g_s), s	1.6	13.6	13.7	7.3	10.1	3.8	2.4	6.1	16.0	13.6	0.0	10.5
Cycle Q Clear(g_c), s	1.6	13.6	13.7	7.3	10.1	3.8	2.4	6.1	16.0	13.6	0.0	10.5
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	55	761	408	190	1063	474	71	416	352	324	0	644
V/C Ratio(X)	0.58	0.75	0.75	0.80	0.47	0.19	0.70	0.37	0.85	0.88	0.00	0.44
Avail Cap(c_a), veh/h	405	1937	1038	405	2022	902	405	638	541	405	0	644
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.0	31.8	31.8	38.4	25.1	22.9	41.7	29.0	32.8	35.0	0.0	21.1
Incr Delay (d2), s/veh	9.4	0.6	1.0	7.7	0.5	0.3	11.7	0.5	8.1	16.3	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	5.5	5.9	3.4	4.0	1.4	1.3	2.7	6.7	7.2	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.4	32.3	32.9	46.0	25.6	23.2	53.3	29.5	41.0	51.3	0.0	21.6
LnGrp LOS	D	C	C	D	C	C	D	C	D	D	A	C
Approach Vol, veh/h		904			744			504			564	
Approach Delay, s/veh		33.2			29.5			38.7			36.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	25.6	9.1	38.5	8.0	32.3	21.6	26.0
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	9.3	15.7	4.4	12.5	3.6	12.1	15.6	18.0
Green Ext Time (p_c), s	0.3	3.9	0.1	1.5	0.0	5.4	0.3	1.5

Intersection Summary	
HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	13.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	0	25	50	121	9	19	35	80	116	34	113	0
Future Vol, veh/h	0	25	50	121	9	19	35	80	116	34	113	0
Peak Hour Factor	0.75	0.75	0.75	0.59	0.59	0.59	0.63	0.63	0.63	0.53	0.53	0.53
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	33	67	205	15	32	56	127	184	64	213	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10	13.2	13.9	12.9
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	0%	81%	23%
Vol Thru, %	35%	33%	6%	77%
Vol Right, %	50%	67%	13%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	231	75	149	147
LT Vol	35	0	121	34
Through Vol	80	25	9	113
RT Vol	116	50	19	0
Lane Flow Rate	367	100	253	277
Geometry Grp	1	1	1	1
Degree of Util (X)	0.528	0.161	0.415	0.432
Departure Headway (Hd)	5.181	5.78	5.918	5.608
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	693	616	606	638
Service Time	3.238	3.86	3.983	3.671
HCM Lane V/C Ratio	0.53	0.162	0.417	0.434
HCM Control Delay	13.9	10	13.2	12.9
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	3.1	0.6	2	2.2

Intersection												
Int Delay, s/veh	2.6											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	0	36	0	3	16	25	0	0	9	29	0	1
Future Vol, veh/h	0	36	0	3	16	25	0	0	9	29	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	42	42	56	56	56	100	100	100	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	86	0	5	29	45	0	0	9	46	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	74	0	0	86	0	0	149	170	86	153	148	52
Stage 1	-	-	-	-	-	-	86	86	-	62	62	-
Stage 2	-	-	-	-	-	-	63	84	-	91	86	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1526	-	-	1510	-	-	819	723	973	814	743	1016
Stage 1	-	-	-	-	-	-	922	824	-	949	843	-
Stage 2	-	-	-	-	-	-	948	825	-	916	824	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1526	-	-	1510	-	-	816	721	973	804	741	1016
Mov Cap-2 Maneuver	-	-	-	-	-	-	816	721	-	804	741	-
Stage 1	-	-	-	-	-	-	922	824	-	949	840	-
Stage 2	-	-	-	-	-	-	944	823	-	908	824	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	8.7	9.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	973	1526	-	-	1510	-	-	810
HCM Lane V/C Ratio	0.009	-	-	-	0.004	-	-	0.059
HCM Control Delay (s)	8.7	0	-	-	7.4	0	-	9.7
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Intersection						
Int Delay, s/veh	0.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	4	12	194	162	4
Future Vol, veh/h	6	4	12	194	162	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	64	64	61	61
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	8	19	303	266	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	611	270	273	0	-	0
Stage 1	270	-	-	-	-	-
Stage 2	341	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	457	769	1290	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	720	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	449	769	1290	-	-	-
Mov Cap-2 Maneuver	449	-	-	-	-	-
Stage 1	761	-	-	-	-	-
Stage 2	720	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1290	-	539	-	-
HCM Lane V/C Ratio	0.015	-	0.037	-	-
HCM Control Delay (s)	7.8	0	11.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	2.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	12	47	14	22	17
Future Vol, veh/h	5	12	47	14	22	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	12	47	14	22	17

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	115	54	0	0	61	0
Stage 1	54	-	-	-	-	-
Stage 2	61	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	881	1013	-	-	1542	-
Stage 1	969	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	869	1013	-	-	1542	-
Mov Cap-2 Maneuver	869	-	-	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	949	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	4.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	966	1542	-
HCM Lane V/C Ratio	-	-	0.018	0.014	-
HCM Control Delay (s)	-	-	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	56.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	465	387	116	330	71
Future Vol, veh/h	25	465	387	116	330	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	465	387	116	330	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	503	0	-	0	960	445
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	515	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1061	-	-	-	~ 285	613
Stage 1	-	-	-	-	646	-
Stage 2	-	-	-	-	600	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1061	-	-	-	~ 276	613
Mov Cap-2 Maneuver	-	-	-	-	~ 276	-
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	600	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	195.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1061	-	-	-	306
HCM Lane V/C Ratio	0.024	-	-	-	1.31
HCM Control Delay (s)	8.5	0	-	-	195.3
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	19.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	654	0	0	806	285	88	0	226	0	0	0
Future Volume (veh/h)	119	654	0	0	806	285	88	0	226	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	151	828	0	0	916	324	105	0	269			
Peak Hour Factor	0.79	0.79	0.79	0.88	0.88	0.88	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	193	2138	0	0	1133	399	126	0	323			
Arrive On Green	0.11	0.60	0.00	0.00	0.44	0.44	0.27	0.00	0.27			
Sat Flow, veh/h	1781	3647	0	0	2670	907	459	0	1176			
Grp Volume(v), veh/h	151	828	0	0	630	610	374	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1707	1636	0	0			
Q Serve(g_s), s	6.1	9.0	0.0	0.0	22.9	23.1	16.0	0.0	0.0			
Cycle Q Clear(g_c), s	6.1	9.0	0.0	0.0	22.9	23.1	16.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.53	0.28		0.72			
Lane Grp Cap(c), veh/h	193	2138	0	0	781	750	449	0	0			
V/C Ratio(X)	0.78	0.39	0.00	0.00	0.81	0.81	0.83	0.00	0.00			
Avail Cap(c_a), veh/h	480	2823	0	0	837	804	771	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	32.3	7.7	0.0	0.0	18.1	18.1	25.4	0.0	0.0			
Incr Delay (d2), s/veh	6.8	0.2	0.0	0.0	6.4	6.9	4.9	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.9	2.8	0.0	0.0	9.7	9.5	6.1	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	7.9	0.0	0.0	24.5	25.1	30.3	0.0	0.0			
LnGrp LOS	D	A	A	A	C	C	C	A	A			
Approach Vol, veh/h		979			1240			374				
Approach Delay, s/veh		12.7			24.8			30.3				
Approach LOS		B			C			C				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		49.3			12.0	37.3		25.0				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0				
Max Q Clear Time (g_c+I1), s		11.0			8.1	25.1		18.0				
Green Ext Time (p_c), s		13.1			0.3	7.5		2.4				
Intersection Summary												
HCM 6th Ctrl Delay			21.0									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	533	93	293	601	0	0	0	0	240	4	121
Future Volume (veh/h)	0	533	93	293	601	0	0	0	0	240	4	121
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	784	137	337	691	0				267	4	134
Peak Hour Factor	0.68	0.68	0.68	0.87	0.87	0.87				0.90	0.90	0.90
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1394	242	385	1103	0				321	5	161
Arrive On Green	0.00	0.32	0.32	0.22	0.59	0.00				0.28	0.28	0.28
Sat Flow, veh/h	0	4547	759	1781	1870	0				1129	17	566
Grp Volume(v), veh/h	0	608	313	337	691	0				405	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1734	1781	1870	0				1712	0	0
Q Serve(g_s), s	0.0	10.8	10.9	13.3	17.5	0.0				16.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.8	10.9	13.3	17.5	0.0				16.2	0.0	0.0
Prop In Lane	0.00		0.44	1.00		0.00				0.66		0.33
Lane Grp Cap(c), veh/h	0	1084	552	385	1103	0				487	0	0
V/C Ratio(X)	0.00	0.56	0.57	0.87	0.63	0.00				0.83	0.00	0.00
Avail Cap(c_a), veh/h	0	1633	832	488	1513	0				821	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	20.6	20.7	27.6	9.7	0.0				24.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	1.8	13.5	1.1	0.0				4.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.1	4.4	6.8	6.1	0.0				6.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	21.5	22.5	41.1	10.9	0.0				29.0	0.0	0.0
LnGrp LOS	A	C	C	D	B	A				C	A	A
Approach Vol, veh/h		921			1028						405	
Approach Delay, s/veh		21.8			20.8						29.0	
Approach LOS		C			C						C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.8	27.8		25.3		47.6
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6
Max Green Setting (Gmax), s	20.0	35.0		35.0		59.0
Max Q Clear Time (g_c+I1), s	15.3	12.9		18.2		19.5
Green Ext Time (p_c), s	0.5	10.3		2.6		10.6

Intersection Summary		
HCM 6th Ctrl Delay		22.6
HCM 6th LOS		C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	377	642	0	0	576	229	262	4	276	0	0	0
Future Volume (veh/h)	377	642	0	0	576	229	262	4	276	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	401	683	0	0	613	0	312	5	329			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	457	2068	0	0	926		464	7	419			
Arrive On Green	0.26	0.58	0.00	0.00	0.26	0.00	0.26	0.26	0.26			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1755	28	1585			
Grp Volume(v), veh/h	401	683	0	0	613	0	317	0	329			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1783	0	1585			
Q Serve(g_s), s	13.9	6.4	0.0	0.0	10.0	0.0	10.3	0.0	12.4			
Cycle Q Clear(g_c), s	13.9	6.4	0.0	0.0	10.0	0.0	10.3	0.0	12.4			
Prop In Lane	1.00		0.00	0.00		1.00	0.98		1.00			
Lane Grp Cap(c), veh/h	457	2068	0	0	926		472	0	419			
V/C Ratio(X)	0.88	0.33	0.00	0.00	0.66		0.67	0.00	0.78			
Avail Cap(c_a), veh/h	552	2983	0	0	1651		856	0	761			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	23.0	7.0	0.0	0.0	21.3	0.0	21.2	0.0	22.0			
Incr Delay (d2), s/veh	13.5	0.1	0.0	0.0	1.2	0.0	1.7	0.0	3.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.8	1.7	0.0	0.0	3.7	0.0	3.9	0.0	4.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	7.1	0.0	0.0	22.5	0.0	22.9	0.0	25.3			
LnGrp LOS	D	A	A	A	C		C	A	C			
Approach Vol, veh/h		1084			613			646				
Approach Delay, s/veh		18.0			22.5			24.1				
Approach LOS		B			C			C				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		42.9			20.8	22.1		21.7				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		8.4			15.9	12.0		14.4				
Green Ext Time (p_c), s		7.2			0.6	4.9		2.7				

Intersection Summary		
HCM 6th Ctrl Delay		20.9
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	741	433	258	580	0	0	0	0	278	6	232
Future Volume (veh/h)	0	741	433	258	580	0	0	0	0	278	6	232
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	797	466	284	637	0				307	41	276
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91				0.84	0.84	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1630	506	335	1075	0				474	56	375
Arrive On Green	0.00	0.32	0.32	0.19	0.57	0.00				0.27	0.27	0.27
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	209	1408
Grp Volume(v), veh/h	0	797	466	284	637	0				307	0	317
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1617
Q Serve(g_s), s	0.0	7.8	17.7	9.6	13.7	0.0				9.5	0.0	11.2
Cycle Q Clear(g_c), s	0.0	7.8	17.7	9.6	13.7	0.0				9.5	0.0	11.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.87
Lane Grp Cap(c), veh/h	0	1630	506	335	1075	0				474	0	430
V/C Ratio(X)	0.00	0.49	0.92	0.85	0.59	0.00				0.65	0.00	0.74
Avail Cap(c_a), veh/h	0	1639	509	372	1116	0				1000	0	908
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.1	20.5	24.4	8.5	0.0				20.3	0.0	20.9
Incr Delay (d2), s/veh	0.0	0.2	22.2	16.8	0.8	0.0				1.8	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.6	8.5	5.1	3.9	0.0				3.6	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.3	42.6	41.2	9.3	0.0				22.1	0.0	23.8
LnGrp LOS	A	B	D	D	A	A				C	A	C
Approach Vol, veh/h		1263			921						624	
Approach Delay, s/veh		26.7			19.2						23.0	
Approach LOS		C			B						C	

Timer - Assigned Phs	1	2	4	6
Phs Duration (G+Y+Rc), s	15.9	25.2	21.2	41.1
Change Period (Y+Rc), s	* 4.2	5.3	4.6	5.3
Max Green Setting (Gmax), s	* 13	20.0	35.0	37.2
Max Q Clear Time (g_c+I1), s	11.6	19.7	13.2	15.7
Green Ext Time (p_c), s	0.2	0.2	3.4	3.9

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	351	34	311	343	120	477
Future Volume (veh/h)	351	34	311	343	120	477
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	616	60	389	429	143	568
Peak Hour Factor	0.57	0.57	0.80	0.80	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1002	447	572	1905	493	773
Arrive On Green	0.28	0.28	0.17	0.54	0.28	0.28
Sat Flow, veh/h	3647	1585	3456	3647	1781	2790
Grp Volume(v), veh/h	616	60	389	429	143	568
Grp Sat Flow(s),veh/h/ln	1777	1585	1728	1777	1781	1395
Q Serve(g_s), s	7.8	1.5	5.5	3.3	3.3	9.6
Cycle Q Clear(g_c), s	7.8	1.5	5.5	3.3	3.3	9.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1002	447	572	1905	493	773
V/C Ratio(X)	0.61	0.13	0.68	0.23	0.29	0.74
Avail Cap(c_a), veh/h	3426	1528	1333	5112	1759	2754
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	13.9	20.4	6.3	14.7	17.0
Incr Delay (d2), s/veh	0.6	0.1	1.4	0.1	0.3	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.4	2.1	0.9	1.1	2.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.8	14.0	21.8	6.4	15.1	18.4
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	676			818	711	
Approach Delay, s/veh	16.5			13.7	17.7	
Approach LOS	B			B	B	

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	13.2	19.7	32.9	19.0
Change Period (Y+Rc), s	4.6	5.1	5.1	4.6
Max Green Setting (Gmax), s	20.0	50.0	74.6	51.2
Max Q Clear Time (g_c+I1), s	7.5	9.8	5.3	11.6
Green Ext Time (p_c), s	1.1	4.8	3.1	2.8

Intersection Summary	
HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	0	142	0	0	2	63	542	0	3	346	32
Future Volume (veh/h)	24	0	142	0	0	2	63	542	0	3	346	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	0	245	0	0	4	74	638	0	5	532	49
Peak Hour Factor	0.58	0.58	0.58	0.50	0.50	0.50	0.85	0.85	0.85	0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	0	384	5	0	91	178	1799	0	17	1248	114
Arrive On Green	0.06	0.00	0.24	0.00	0.00	0.06	0.10	0.35	0.00	0.01	0.26	0.26
Sat Flow, veh/h	1781	0	1585	1781	0	1585	1781	5274	0	1781	4762	434
Grp Volume(v), veh/h	41	0	245	0	0	4	74	638	0	5	379	202
Grp Sat Flow(s),veh/h/ln	1781	0	1585	1781	0	1585	1781	1702	0	1781	1702	1792
Q Serve(g_s), s	0.8	0.0	5.3	0.0	0.0	0.1	1.5	3.5	0.0	0.1	3.5	3.6
Cycle Q Clear(g_c), s	0.8	0.0	5.3	0.0	0.0	0.1	1.5	3.5	0.0	0.1	3.5	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.24
Lane Grp Cap(c), veh/h	115	0	384	5	0	91	178	1799	0	17	892	470
V/C Ratio(X)	0.36	0.00	0.64	0.00	0.00	0.04	0.42	0.35	0.00	0.30	0.42	0.43
Avail Cap(c_a), veh/h	467	0	1454	467	0	1454	934	4683	0	467	2230	1174
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.1	0.0	12.9	0.0	0.0	17.0	16.1	9.1	0.0	18.8	11.7	11.7
Incr Delay (d2), s/veh	1.9	0.0	2.5	0.0	0.0	0.3	1.6	0.2	0.0	9.4	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	1.8	0.0	0.0	0.0	0.5	0.8	0.0	0.1	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.9	0.0	15.4	0.0	0.0	17.3	17.7	9.3	0.0	28.2	12.1	12.6
LnGrp LOS	B	A	B	A	A	B	B	A	A	C	B	B
Approach Vol, veh/h		286			4			712			586	
Approach Delay, s/veh		15.9			17.3			10.2			12.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	0.0	14.0	8.4	15.8	7.1	6.9	5.0	19.2
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	0.0	7.3	3.5	5.6	2.8	2.1	2.1	5.5
Green Ext Time (p_c), s	0.0	2.4	0.1	4.4	0.0	0.0	0.0	5.9

Intersection Summary	
HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	347	781	69	350	728	101	77	208	182	124	143	228
Future Volume (veh/h)	347	781	69	350	728	101	77	208	182	124	143	228
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	413	930	82	407	847	117	87	234	204	188	217	345
Peak Hour Factor	0.84	0.84	0.84	0.86	0.86	0.86	0.89	0.89	0.89	0.66	0.66	0.66
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	438	1698	527	500	1180	366	113	1194	653	267	1266	393
Arrive On Green	0.25	0.33	0.33	0.14	0.23	0.23	0.06	0.23	0.23	0.08	0.25	0.25
Sat Flow, veh/h	1781	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	413	930	82	407	847	117	87	234	204	188	217	345
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	23.1	15.1	3.7	11.6	15.5	6.2	4.9	3.7	6.1	5.4	3.4	21.3
Cycle Q Clear(g_c), s	23.1	15.1	3.7	11.6	15.5	6.2	4.9	3.7	6.1	5.4	3.4	21.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	438	1698	527	500	1180	366	113	1194	653	267	1266	393
V/C Ratio(X)	0.94	0.55	0.16	0.81	0.72	0.32	0.77	0.20	0.31	0.70	0.17	0.88
Avail Cap(c_a), veh/h	438	2010	624	850	2010	624	438	1758	961	850	1758	546
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	27.7	23.9	42.1	36.0	32.4	46.9	31.3	32.2	45.7	30.0	36.7
Incr Delay (d2), s/veh	28.9	0.3	0.1	3.3	0.8	0.5	10.5	0.1	0.3	3.4	0.1	11.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.0	5.8	1.3	5.0	6.2	2.3	2.4	1.5	2.0	2.3	1.3	9.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.5	28.0	24.0	45.4	36.8	32.9	57.3	31.3	32.4	49.1	30.1	48.3
LnGrp LOS	E	C	C	D	D	C	E	C	C	D	C	D
Approach Vol, veh/h		1425			1371			525			750	
Approach Delay, s/veh		38.9			39.1			36.1			43.2	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.7	39.8	10.9	31.2	30.0	29.5	12.4	29.8
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	13.6	17.1	6.9	23.3	25.1	17.5	7.4	8.1
Green Ext Time (p_c), s	1.1	6.5	0.2	1.9	0.0	6.0	0.5	2.2

Intersection Summary	
HCM 6th Ctrl Delay	39.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	9	7	2	24	16	1	74	0	42	112	113
Future Volume (veh/h)	107	9	7	2	24	16	1	74	0	42	112	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	126	11	8	4	48	32	1	95	0	58	153	155
Peak Hour Factor	0.85	0.85	0.85	0.50	0.50	0.50	0.78	0.78	0.78	0.73	0.73	0.73
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	168	305	258	8	136	116	5	1020	0	88	1267	393
Arrive On Green	0.09	0.16	0.16	0.00	0.07	0.07	0.00	0.20	0.00	0.05	0.25	0.25
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5274	0	1781	5106	1585
Grp Volume(v), veh/h	126	11	8	4	48	32	1	95	0	58	153	155
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	0	1781	1702	1585
Q Serve(g_s), s	2.4	0.2	0.1	0.1	0.8	0.7	0.0	0.5	0.0	1.1	0.8	2.8
Cycle Q Clear(g_c), s	2.4	0.2	0.1	0.1	0.8	0.7	0.0	0.5	0.0	1.1	0.8	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	168	305	258	8	136	116	5	1020	0	88	1267	393
V/C Ratio(X)	0.75	0.04	0.03	0.51	0.35	0.28	0.19	0.09	0.00	0.66	0.12	0.39
Avail Cap(c_a), veh/h	1039	1364	1156	1039	1364	1156	1039	4468	0	1039	4468	1387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.1	12.1	12.1	17.0	15.1	15.0	17.1	11.2	0.0	16.0	10.0	10.7
Incr Delay (d2), s/veh	6.5	0.0	0.0	44.2	1.5	1.3	17.0	0.1	0.0	8.0	0.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.1	0.0	0.1	0.4	0.2	0.0	0.1	0.0	0.5	0.2	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.7	12.1	12.1	61.2	16.7	16.3	34.1	11.3	0.0	24.1	10.1	13.1
LnGrp LOS	C	B	B	E	B	B	C	B	A	C	B	B
Approach Vol, veh/h		145			84			96			366	
Approach Delay, s/veh		20.4			18.7			11.6			13.6	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.6	10.6	4.5	14.5	7.7	7.5	6.2	12.9
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	2.2	2.0	4.8	4.4	2.8	3.1	2.5
Green Ext Time (p_c), s	0.0	0.0	0.0	3.7	0.3	0.3	0.1	1.1

Intersection Summary	
HCM 6th Ctrl Delay	15.4
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	860	48	217	656	155	12	25	207	130	31	11
Future Volume (veh/h)	40	860	48	217	656	155	12	25	207	130	31	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	1178	66	231	698	165	13	27	223	171	41	14
Peak Hour Factor	0.73	0.73	0.73	0.94	0.94	0.94	0.93	0.93	0.93	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	1515	85	270	1480	660	27	312	264	209	358	122
Arrive On Green	0.04	0.31	0.31	0.15	0.42	0.42	0.02	0.17	0.17	0.12	0.27	0.27
Sat Flow, veh/h	1781	4947	277	1781	3554	1585	1781	1870	1585	1781	1333	455
Grp Volume(v), veh/h	55	810	434	231	698	165	13	27	223	171	0	55
Grp Sat Flow(s),veh/h/ln	1781	1702	1820	1781	1777	1585	1781	1870	1585	1781	0	1788
Q Serve(g_s), s	2.8	19.7	19.7	11.5	12.9	6.1	0.7	1.1	12.4	8.5	0.0	2.1
Cycle Q Clear(g_c), s	2.8	19.7	19.7	11.5	12.9	6.1	0.7	1.1	12.4	8.5	0.0	2.1
Prop In Lane	1.00		0.15	1.00		1.00	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	74	1042	557	270	1480	660	27	312	264	209	0	480
V/C Ratio(X)	0.75	0.78	0.78	0.85	0.47	0.25	0.47	0.09	0.84	0.82	0.00	0.11
Avail Cap(c_a), veh/h	393	1877	1004	393	1960	874	393	619	524	393	0	592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.0	28.6	28.6	37.5	19.2	17.2	44.3	31.9	36.6	39.1	0.0	25.0
Incr Delay (d2), s/veh	13.9	0.5	0.9	11.8	0.3	0.3	12.2	0.1	7.2	7.6	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	7.7	8.3	5.6	4.9	2.2	0.4	0.5	5.2	4.1	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	29.1	29.5	49.3	19.5	17.5	56.4	32.1	43.9	46.7	0.0	25.1
LnGrp LOS	E	C	C	D	B	B	E	C	D	D	A	C
Approach Vol, veh/h		1299			1094			263			226	
Approach Delay, s/veh		30.4			25.5			43.3			41.4	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.1	33.8	7.0	30.9	9.0	43.8	16.2	21.6
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	13.5	21.7	2.7	4.1	4.8	14.9	10.5	14.4
Green Ext Time (p_c), s	0.3	6.1	0.0	0.2	0.1	8.2	0.3	0.7

Intersection Summary	
HCM 6th Ctrl Delay	30.6
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	20	42	106	34	26	34	59	82	23	37	0
Future Vol, veh/h	0	20	42	106	34	26	34	59	82	23	37	0
Peak Hour Factor	0.61	0.61	0.61	0.54	0.54	0.54	0.75	0.75	0.75	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	33	69	196	63	48	45	79	109	28	45	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.5	11.3	10	9
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	0%	64%	38%
Vol Thru, %	34%	32%	20%	62%
Vol Right, %	47%	68%	16%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	175	62	166	60
LT Vol	34	0	106	23
Through Vol	59	20	34	37
RT Vol	82	42	26	0
Lane Flow Rate	233	102	307	72
Geometry Grp	1	1	1	1
Degree of Util (X)	0.309	0.132	0.413	0.106
Departure Headway (Hd)	4.771	4.665	4.833	5.302
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	747	760	741	669
Service Time	2.839	2.746	2.897	3.39
HCM Lane V/C Ratio	0.312	0.134	0.414	0.108
HCM Control Delay	10	8.5	11.3	9
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	1.3	0.5	2	0.4

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	32	0	11	26	24	0	0	6	25	0	3
Future Vol, veh/h	0	32	0	11	26	24	0	0	6	25	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	71	71	71	100	100	100	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	64	0	15	37	34	0	0	6	28	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	71	0	0	64	0	0	150	165	64	151	148	54
Stage 1	-	-	-	-	-	-	64	64	-	84	84	-
Stage 2	-	-	-	-	-	-	86	101	-	67	64	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1529	-	-	1538	-	-	818	728	1000	816	743	1013
Stage 1	-	-	-	-	-	-	947	842	-	924	825	-
Stage 2	-	-	-	-	-	-	922	811	-	943	842	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1529	-	-	1538	-	-	809	721	1000	805	736	1013
Mov Cap-2 Maneuver	-	-	-	-	-	-	809	721	-	805	736	-
Stage 1	-	-	-	-	-	-	947	842	-	924	817	-
Stage 2	-	-	-	-	-	-	910	803	-	937	842	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.3	8.6	9.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1000	1529	-	-	1538	-	-	823
HCM Lane V/C Ratio	0.006	-	-	-	0.01	-	-	0.039
HCM Control Delay (s)	8.6	0	-	-	7.4	0	-	9.6
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	0.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	8	11	147	185	5
Future Vol, veh/h	8	8	11	147	185	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	57	57	75	75	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	14	15	196	349	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	580	354	358	0	-	0
Stage 1	354	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	477	690	1201	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	470	690	1201	-	-	-
Mov Cap-2 Maneuver	470	-	-	-	-	-
Stage 1	700	-	-	-	-	-
Stage 2	812	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1201	-	559	-	-
HCM Lane V/C Ratio	0.012	-	0.05	-	-
HCM Control Delay (s)	8	0	11.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	13	32	10	22	54
Future Vol, veh/h	16	13	32	10	22	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	13	32	10	22	54

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	135	37	0	0	42	0
Stage 1	37	-	-	-	-	-
Stage 2	98	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	859	1035	-	-	1567	-
Stage 1	985	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	847	1035	-	-	1567	-
Mov Cap-2 Maneuver	847	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	913	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	2.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	922	1567	-
HCM Lane V/C Ratio	-	-	0.031	0.014	-
HCM Control Delay (s)	-	-	9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	61.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	81	726	301	378	222	48
Future Vol, veh/h	81	726	301	378	222	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	81	726	301	378	222	48

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	679	0	-	0	1378	490
Stage 1	-	-	-	-	490	-
Stage 2	-	-	-	-	888	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	913	-	-	-	~ 160	578
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	402	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	913	-	-	-	~ 136	578
Mov Cap-2 Maneuver	-	-	-	-	~ 136	-
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	402	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	$ 399.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	913	-	-	-	157
HCM Lane V/C Ratio	0.089	-	-	-	1.72
HCM Control Delay (s)	9.3	0	-	-	$ 399.6
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.3	-	-	-	19.4

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	813	0	0	738	248	64	5	398	0	0	0
Future Volume (veh/h)	136	813	0	0	738	248	64	5	398	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	177	1056	0	0	829	279	76	6	474			
Peak Hour Factor	0.77	0.77	0.77	0.89	0.89	0.89	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	215	1891	0	0	959	323	81	6	504			
Arrive On Green	0.12	0.53	0.00	0.00	0.37	0.37	0.37	0.37	0.37			
Sat Flow, veh/h	1781	3647	0	0	2705	878	220	17	1374			
Grp Volume(v), veh/h	177	1056	0	0	564	544	556	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1712	1612	0	0			
Q Serve(g_s), s	8.8	18.0	0.0	0.0	26.8	26.8	30.4	0.0	0.0			
Cycle Q Clear(g_c), s	8.8	18.0	0.0	0.0	26.8	26.8	30.4	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.51	0.14		0.85			
Lane Grp Cap(c), veh/h	215	1891	0	0	653	629	591	0	0			
V/C Ratio(X)	0.82	0.56	0.00	0.00	0.86	0.87	0.94	0.00	0.00			
Avail Cap(c_a), veh/h	391	2302	0	0	683	658	620	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	39.1	14.2	0.0	0.0	26.7	26.7	27.9	0.0	0.0			
Incr Delay (d2), s/veh	7.6	0.5	0.0	0.0	11.7	12.2	22.3	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.2	6.7	0.0	0.0	12.8	12.4	14.2	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.7	14.7	0.0	0.0	38.4	38.9	50.1	0.0	0.0			
LnGrp LOS	D	B	A	A	D	D	D	A	A			
Approach Vol, veh/h		1233			1108			556				
Approach Delay, s/veh		19.3			38.7			50.1				
Approach LOS		B			D			D				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		53.1			15.0	38.1		38.0				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0				
Max Q Clear Time (g_c+I1), s		20.0			10.8	28.8		32.4				
Green Ext Time (p_c), s		16.9			0.3	4.6		1.0				

Intersection Summary			
HCM 6th Ctrl Delay			32.6
HCM 6th LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	622	72	225	577	0	0	0	0	327	8	159
Future Volume (veh/h)	0	622	72	225	577	0	0	0	0	327	8	159
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	852	99	253	648	0				376	9	183
Peak Hour Factor	0.73	0.73	0.73	0.89	0.89	0.89				0.87	0.87	0.87
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1413	163	297	973	0				417	10	203
Arrive On Green	0.00	0.30	0.30	0.17	0.52	0.00				0.37	0.37	0.37
Sat Flow, veh/h	0	4809	537	1781	1870	0				1135	27	552
Grp Volume(v), veh/h	0	624	327	253	648	0				568	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1774	1781	1870	0				1714	0	0
Q Serve(g_s), s	0.0	12.8	12.9	11.3	20.8	0.0				25.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	12.8	12.9	11.3	20.8	0.0				25.6	0.0	0.0
Prop In Lane	0.00		0.30	1.00		0.00				0.66		0.32
Lane Grp Cap(c), veh/h	0	1037	540	297	973	0				630	0	0
V/C Ratio(X)	0.00	0.60	0.61	0.85	0.67	0.00				0.90	0.00	0.00
Avail Cap(c_a), veh/h	0	1457	759	436	1349	0				734	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	24.2	24.2	33.1	14.4	0.0				24.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.1	2.1	10.3	1.5	0.0				13.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.0	5.4	5.5	8.1	0.0				11.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	25.3	26.4	43.4	15.9	0.0				37.9	0.0	0.0
LnGrp LOS	A	C	C	D	B	A				D	A	A
Approach Vol, veh/h		951			901						568	
Approach Delay, s/veh		25.7			23.7						37.9	
Approach LOS		C			C						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.6	29.5		34.6		47.1						
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6						
Max Green Setting (Gmax), s	20.0	35.0		35.0		59.0						
Max Q Clear Time (g_c+I1), s	13.3	14.9		27.6		22.8						
Green Ext Time (p_c), s	0.4	10.0		2.4		9.4						
Intersection Summary												
HCM 6th Ctrl Delay			27.8									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	291	811	0	0	681	434	408	6	432	0	0	0
Future Volume (veh/h)	291	811	0	0	681	434	408	6	432	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	313	872	0	0	709	0	425	6	450			
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	363	1905	0	0	980		582	8	525			
Arrive On Green	0.20	0.54	0.00	0.00	0.28	0.00	0.33	0.33	0.33			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1758	25	1585			
Grp Volume(v), veh/h	313	872	0	0	709	0	431	0	450			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	12.7	11.2	0.0	0.0	13.5	0.0	15.9	0.0	19.8			
Cycle Q Clear(g_c), s	12.7	11.2	0.0	0.0	13.5	0.0	15.9	0.0	19.8			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	363	1905	0	0	980		590	0	525			
V/C Ratio(X)	0.86	0.46	0.00	0.00	0.72		0.73	0.00	0.86			
Avail Cap(c_a), veh/h	478	2584	0	0	1430		741	0	659			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	28.7	10.6	0.0	0.0	24.4	0.0	22.0	0.0	23.3			
Incr Delay (d2), s/veh	12.6	0.2	0.0	0.0	1.5	0.0	2.8	0.0	9.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.2	3.5	0.0	0.0	5.3	0.0	6.3	0.0	7.8			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	10.9	0.0	0.0	25.9	0.0	24.8	0.0	32.3			
LnGrp LOS	D	B	A	A	C		C	A	C			
Approach Vol, veh/h		1185			709			881				
Approach Delay, s/veh		18.9			25.9			28.6				
Approach LOS		B			C			C				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		45.3			19.4	25.9		29.3				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		13.2			14.7	15.5		21.8				
Green Ext Time (p_c), s		9.7			0.6	5.1		2.9				

Intersection Summary		
HCM 6th Ctrl Delay		23.8
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	816	368	239	850	0	0	0	0	286	1	337
Future Volume (veh/h)	0	816	368	239	850	0	0	0	0	286	1	337
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	887	400	252	895	0				386	1	455
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95				0.74	0.74	0.74
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1431	444	298	948	0				627	1	557
Arrive On Green	0.00	0.28	0.28	0.17	0.51	0.00				0.35	0.35	0.35
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	3	1582
Grp Volume(v), veh/h	0	887	400	252	895	0				386	0	456
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1586
Q Serve(g_s), s	0.0	10.6	17.1	9.7	31.8	0.0				12.6	0.0	18.4
Cycle Q Clear(g_c), s	0.0	10.6	17.1	9.7	31.8	0.0				12.6	0.0	18.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1431	444	298	948	0				627	0	558
V/C Ratio(X)	0.00	0.62	0.90	0.85	0.94	0.00				0.62	0.00	0.82
Avail Cap(c_a), veh/h	0	1452	451	329	989	0				886	0	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	22.0	24.4	28.4	16.4	0.0				18.8	0.0	20.7
Incr Delay (d2), s/veh	0.0	0.8	20.6	18.6	16.4	0.0				1.2	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	8.2	5.3	14.7	0.0				4.7	0.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	22.8	45.0	47.0	32.8	0.0				20.0	0.0	25.8
LnGrp LOS	A	C	D	D	C	A				C	A	C
Approach Vol, veh/h		1287			1147						842	
Approach Delay, s/veh		29.7			35.9						23.2	
Approach LOS		C			D						C	

Timer - Assigned Phs	1	2	4	6
Phs Duration (G+Y+Rc), s	15.9	25.0	29.4	41.0
Change Period (Y+Rc), s	* 4.2	5.3	4.6	5.3
Max Green Setting (Gmax), s	* 13	20.0	35.0	37.2
Max Q Clear Time (g_c+I1), s	11.7	19.1	20.4	33.8
Green Ext Time (p_c), s	0.2	0.6	4.4	1.8

Intersection Summary	
HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	465	387	116	330	71
Future Volume (veh/h)	25	465	387	116	330	71
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	465	387	116	330	71
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	54	979	527	158	450	400
Arrive On Green	0.03	0.52	0.38	0.38	0.25	0.25
Sat Flow, veh/h	1781	1870	1382	414	1781	1585
Grp Volume(v), veh/h	25	465	0	503	330	71
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1796	1781	1585
Q Serve(g_s), s	0.6	6.3	0.0	9.7	6.8	1.4
Cycle Q Clear(g_c), s	0.6	6.3	0.0	9.7	6.8	1.4
Prop In Lane	1.00			0.23	1.00	1.00
Lane Grp Cap(c), veh/h	54	979	0	684	450	400
V/C Ratio(X)	0.46	0.48	0.00	0.74	0.73	0.18
Avail Cap(c_a), veh/h	333	3375	0	2704	2150	1913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	6.1	0.0	10.7	13.8	11.7
Incr Delay (d2), s/veh	6.1	0.4	0.0	1.6	2.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	1.5	0.0	3.0	2.6	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.2	6.4	0.0	12.2	16.1	12.0
LnGrp LOS	C	A	A	B	B	B
Approach Vol, veh/h		490	503		401	
Approach Delay, s/veh		7.4	12.2		15.4	
Approach LOS		A	B		B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		25.5		14.6	5.7	19.8
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		72.5		48.5	7.5	60.5
Max Q Clear Time (g_c+I1), s		8.3		8.8	2.6	11.7
Green Ext Time (p_c), s		3.2		1.3	0.0	3.6

Intersection Summary			
HCM 6th Ctrl Delay			11.4
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	81	726	301	378	222	48
Future Volume (veh/h)	81	726	301	378	222	48
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	81	726	301	378	222	48
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	120	1214	371	466	309	275
Arrive On Green	0.07	0.65	0.49	0.49	0.17	0.17
Sat Flow, veh/h	1781	1870	754	946	1781	1585
Grp Volume(v), veh/h	81	726	0	679	222	48
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1700	1781	1585
Q Serve(g_s), s	2.2	11.3	0.0	17.1	6.0	1.3
Cycle Q Clear(g_c), s	2.2	11.3	0.0	17.1	6.0	1.3
Prop In Lane	1.00			0.56	1.00	1.00
Lane Grp Cap(c), veh/h	120	1214	0	838	309	275
V/C Ratio(X)	0.68	0.60	0.00	0.81	0.72	0.17
Avail Cap(c_a), veh/h	447	3271	0	2396	1144	1018
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	5.1	0.0	10.8	19.8	17.8
Incr Delay (d2), s/veh	6.5	0.5	0.0	1.9	3.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.3	0.0	5.0	2.5	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.6	5.6	0.0	12.8	22.9	18.1
LnGrp LOS	C	A	A	B	C	B
Approach Vol, veh/h		807	679		270	
Approach Delay, s/veh		8.0	12.8		22.1	
Approach LOS		A	B		C	

Timer - Assigned Phs	2	4	5	6
Phs Duration (G+Y+Rc), s	37.3	13.3	7.9	29.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	88.5	32.5	12.7	71.3
Max Q Clear Time (g_c+I1), s	13.3	8.0	4.2	19.1
Green Ext Time (p_c), s	6.0	0.8	0.1	5.9

Intersection Summary	
HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

Appendix F – 2026 Baseline Conditions Level of Service Sheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	581	65	469	388	376	265	47	276	128	29	21
Future Volume (veh/h)	51	581	65	469	388	376	265	47	276	128	29	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	908	102	521	431	409	353	51	368	139	32	23
Peak Hour Factor	0.92	0.64	0.64	0.90	0.90	0.92	0.75	0.92	0.75	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	1205	538	409	1412	630	390	389	580	172	305	136
Arrive On Green	0.06	0.34	0.34	0.12	0.40	0.40	0.22	0.21	0.21	0.10	0.09	0.09
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	55	908	102	521	431	409	353	51	368	139	32	23
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	2.5	19.2	3.8	10.0	7.0	17.7	16.3	1.9	10.2	6.5	0.7	1.1
Cycle Q Clear(g_c), s	2.5	19.2	3.8	10.0	7.0	17.7	16.3	1.9	10.2	6.5	0.7	1.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	107	1205	538	409	1412	630	390	389	580	172	305	136
V/C Ratio(X)	0.51	0.75	0.19	1.27	0.31	0.65	0.90	0.13	0.63	0.81	0.10	0.17
Avail Cap(c_a), veh/h	211	2102	938	409	2102	938	421	1106	1650	211	1682	750
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.5	24.8	19.7	37.3	17.5	20.7	32.1	27.3	30.5	37.4	35.6	35.8
Incr Delay (d2), s/veh	3.8	1.0	0.2	141.3	0.1	1.1	21.7	0.2	1.2	16.9	0.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	7.7	1.3	12.1	2.7	5.9	8.8	0.8	3.2	3.6	0.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.3	25.8	19.9	178.6	17.6	21.8	53.9	27.4	31.7	54.3	35.8	36.4
LnGrp LOS	D	C	B	F	B	C	D	C	C	D	D	D
Approach Vol, veh/h		1065			1361			772			194	
Approach Delay, s/veh		26.1			80.5			41.5			49.1	
Approach LOS		C			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	33.8	23.1	13.1	9.7	38.7	12.8	23.4
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8
Max Green Setting (Gmax), s	10.0	50.0	20.0	* 40	10.0	50.0	10.0	50.0
Max Q Clear Time (g_c+I1), s	12.0	21.2	18.3	3.1	4.5	19.7	8.5	12.2
Green Ext Time (p_c), s	0.0	7.5	0.2	0.2	0.0	4.6	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	52.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	3	312	21	2	9	115	534	5	21	288	48
Future Volume (veh/h)	96	3	312	21	2	9	115	534	5	21	288	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	5	529	42	4	18	153	712	7	31	424	71
Peak Hour Factor	0.59	0.59	0.59	0.50	0.50	0.50	0.75	0.75	0.75	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	202	6	615	99	99	444	196	1216	12	80	744	122
Arrive On Green	0.11	0.39	0.39	0.06	0.33	0.33	0.11	0.23	0.23	0.05	0.17	0.17
Sat Flow, veh/h	1781	15	1572	1781	296	1334	1781	5214	51	1781	4421	723
Grp Volume(v), veh/h	163	0	534	42	0	22	153	465	254	31	324	171
Grp Sat Flow(s),veh/h/ln	1781	0	1587	1781	0	1630	1781	1702	1861	1781	1702	1740
Q Serve(g_s), s	6.4	0.0	22.1	1.6	0.0	0.7	6.0	8.7	8.7	1.2	6.3	6.5
Cycle Q Clear(g_c), s	6.4	0.0	22.1	1.6	0.0	0.7	6.0	8.7	8.7	1.2	6.3	6.5
Prop In Lane	1.00		0.99	1.00		0.82	1.00		0.03	1.00		0.42
Lane Grp Cap(c), veh/h	202	0	620	99	0	542	196	794	434	80	573	293
V/C Ratio(X)	0.81	0.00	0.86	0.43	0.00	0.04	0.78	0.59	0.59	0.39	0.57	0.58
Avail Cap(c_a), veh/h	249	0	777	249	0	798	498	1666	911	249	1190	608
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	0.0	20.0	32.7	0.0	16.1	31.0	24.3	24.3	33.2	27.3	27.4
Incr Delay (d2), s/veh	14.5	0.0	8.9	2.9	0.0	0.0	6.7	1.0	1.8	3.0	1.3	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	9.1	0.8	0.0	0.2	2.7	3.2	3.6	0.5	2.4	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	0.0	28.9	35.6	0.0	16.2	37.6	25.3	26.1	36.2	28.6	30.0
LnGrp LOS	D	A	C	D	A	B	D	C	C	D	C	C
Approach Vol, veh/h		697			64			872			526	
Approach Delay, s/veh		32.8			28.9			27.7			29.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	32.6	12.5	17.8	12.7	28.5	7.8	22.5
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	3.6	24.1	8.0	8.5	8.4	2.7	3.2	10.7
Green Ext Time (p_c), s	0.0	3.9	0.3	3.4	0.1	0.1	0.0	6.0

Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	326	1110	74	495	568	161	84	199	479	531	144	180
Future Volume (veh/h)	326	1110	74	495	568	161	84	199	479	531	144	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	384	1306	87	589	676	192	101	240	577	805	218	273
Peak Hour Factor	0.85	0.85	0.85	0.84	0.84	0.84	0.83	0.83	0.83	0.66	0.66	0.66
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	444	1403	436	603	1637	508	124	1156	632	603	1690	525
Arrive On Green	0.13	0.27	0.27	0.17	0.32	0.32	0.07	0.23	0.23	0.17	0.33	0.33
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	384	1306	87	589	676	192	101	240	577	805	218	273
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	15.6	35.7	6.0	24.3	14.9	13.4	8.0	5.5	28.9	25.0	4.3	20.0
Cycle Q Clear(g_c), s	15.6	35.7	6.0	24.3	14.9	13.4	8.0	5.5	28.9	25.0	4.3	20.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	444	1403	436	603	1637	508	124	1156	632	603	1690	525
V/C Ratio(X)	0.86	0.93	0.20	0.98	0.41	0.38	0.81	0.21	0.91	1.34	0.13	0.52
Avail Cap(c_a), veh/h	603	1425	442	603	1637	508	311	1247	681	603	1690	525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.2	50.6	39.9	58.9	38.1	37.6	65.7	45.0	54.1	59.2	33.5	38.8
Incr Delay (d2), s/veh	9.6	11.1	0.2	30.9	0.2	0.5	11.8	0.1	16.2	162.2	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	16.2	2.4	13.0	6.1	5.2	4.0	2.3	11.3	24.2	1.7	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.9	61.7	40.1	89.8	38.3	38.1	77.6	45.1	70.2	221.3	33.5	39.7
LnGrp LOS	E	E	D	F	D	D	E	D	E	F	C	D
Approach Vol, veh/h		1777			1457			918			1296	
Approach Delay, s/veh		62.6			59.1			64.5			151.5	
Approach LOS		E			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	45.4	14.5	53.4	23.4	52.0	29.5	38.5
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	26.3	37.7	10.0	22.0	17.6	16.9	27.0	30.9
Green Ext Time (p_c), s	0.0	1.7	0.2	1.8	0.8	5.0	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	83.1
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	237	38	15	3	19	94	5	313	6	77	335	99
Future Volume (veh/h)	237	38	15	3	19	94	5	313	6	77	335	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	308	49	19	4	23	116	6	373	7	104	453	134
Peak Hour Factor	0.77	0.77	0.77	0.81	0.81	0.81	0.84	0.84	0.84	0.74	0.74	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	602	510	8	209	177	11	1049	20	137	1399	434
Arrive On Green	0.21	0.32	0.32	0.00	0.11	0.11	0.01	0.20	0.20	0.08	0.27	0.27
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5161	97	1781	5106	1585
Grp Volume(v), veh/h	308	49	19	4	23	116	6	246	134	104	453	134
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1853	1781	1702	1585
Q Serve(g_s), s	8.3	0.9	0.4	0.1	0.6	3.6	0.2	3.1	3.2	2.9	3.6	3.4
Cycle Q Clear(g_c), s	8.3	0.9	0.4	0.1	0.6	3.6	0.2	3.1	3.2	2.9	3.6	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	381	602	510	8	209	177	11	692	377	137	1399	434
V/C Ratio(X)	0.81	0.08	0.04	0.52	0.11	0.65	0.53	0.36	0.36	0.76	0.32	0.31
Avail Cap(c_a), veh/h	701	920	780	701	920	780	701	2010	1094	701	3015	936
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	12.0	11.8	25.2	20.3	21.6	25.2	17.4	17.4	23.0	14.7	14.6
Incr Delay (d2), s/veh	4.1	0.1	0.0	45.2	0.2	4.0	32.9	1.1	2.1	8.2	0.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.4	0.1	0.1	0.2	1.3	0.2	1.1	1.3	1.4	1.2	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	12.1	11.9	70.4	20.5	25.7	58.1	18.5	19.5	31.2	15.2	16.1
LnGrp LOS	C	B	B	E	C	C	E	B	B	C	B	B
Approach Vol, veh/h		376			143			386			691	
Approach Delay, s/veh		21.1			26.1			19.5			17.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	21.3	4.8	19.9	15.4	10.7	8.4	16.3
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	2.9	2.2	5.6	10.3	5.6	4.9	5.2
Green Ext Time (p_c), s	0.0	0.2	0.0	7.9	0.7	0.4	0.2	5.2

Intersection Summary	
HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	1059	48	130	608	92	44	141	239	198	137	67
Future Volume (veh/h)	47	1059	48	130	608	92	44	141	239	198	137	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	1203	55	157	733	111	56	181	306	360	249	122
Peak Hour Factor	0.88	0.88	0.88	0.83	0.83	0.83	0.78	0.78	0.78	0.55	0.55	0.55
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	1469	67	188	1280	571	73	404	342	316	418	205
Arrive On Green	0.04	0.29	0.29	0.11	0.36	0.36	0.04	0.22	0.22	0.18	0.35	0.35
Sat Flow, veh/h	1781	5005	229	1781	3554	1585	1781	1870	1585	1781	1185	581
Grp Volume(v), veh/h	53	818	440	157	733	111	56	181	306	360	0	371
Grp Sat Flow(s),veh/h/ln	1781	1702	1829	1781	1777	1585	1781	1870	1585	1781	0	1766
Q Serve(g_s), s	3.3	25.2	25.2	9.7	18.7	5.4	3.5	9.5	21.1	20.0	0.0	19.4
Cycle Q Clear(g_c), s	3.3	25.2	25.2	9.7	18.7	5.4	3.5	9.5	21.1	20.0	0.0	19.4
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	69	999	537	188	1280	571	73	404	342	316	0	622
V/C Ratio(X)	0.77	0.82	0.82	0.84	0.57	0.19	0.77	0.45	0.89	1.14	0.00	0.60
Avail Cap(c_a), veh/h	316	1510	811	316	1576	703	316	498	422	316	0	622
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.7	37.0	37.0	49.5	29.1	24.8	53.5	38.4	42.9	46.4	0.0	29.9
Incr Delay (d2), s/veh	16.1	1.3	2.3	9.4	0.6	0.2	15.3	0.8	18.2	93.8	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	10.4	11.4	4.7	7.7	2.1	1.9	4.4	9.9	16.9	0.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.8	38.3	39.4	58.8	29.6	25.0	68.8	39.1	61.1	140.2	0.0	31.5
LnGrp LOS	E	D	D	E	C	C	E	D	E	F	A	C
Approach Vol, veh/h		1311			1001			543			731	
Approach Delay, s/veh		39.9			33.7			54.6			85.0	
Approach LOS		D			C			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.2	39.1	10.2	46.2	9.7	46.6	25.6	30.9
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	11.7	27.2	5.5	21.4	5.3	20.7	22.0	23.1
Green Ext Time (p_c), s	0.2	5.9	0.1	1.4	0.1	7.9	0.0	1.2

Intersection Summary	
HCM 6th Ctrl Delay	49.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	13.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	0	1	54	131	1	21	38	87	126	37	122	0
Future Vol, veh/h	0	1	54	131	1	21	38	87	126	37	122	0
Peak Hour Factor	0.75	0.75	0.75	0.59	0.59	0.59	0.63	0.63	0.63	0.53	0.53	0.53
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	72	222	2	36	60	138	200	70	230	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.6	13.6	15	13.5
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	0%	86%	23%
Vol Thru, %	35%	2%	1%	77%
Vol Right, %	50%	98%	14%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	251	55	153	159
LT Vol	38	0	131	37
Through Vol	87	1	1	122
RT Vol	126	54	21	0
Lane Flow Rate	398	73	259	300
Geometry Grp	1	1	1	1
Degree of Util (X)	0.572	0.117	0.432	0.467
Departure Headway (Hd)	5.167	5.763	5.993	5.603
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	693	617	599	639
Service Time	3.224	3.85	4.058	3.664
HCM Lane V/C Ratio	0.574	0.118	0.432	0.469
HCM Control Delay	15	9.6	13.6	13.5
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	3.6	0.4	2.2	2.5

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	24	12	27	31	1
Future Vol, veh/h	0	24	12	27	31	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	42	42	56	56	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	57	21	48	49	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	69	0	-	0	102	45
Stage 1	-	-	-	-	45	-
Stage 2	-	-	-	-	57	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1532	-	-	-	896	1025
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	966	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1532	-	-	-	896	1025
Mov Cap-2 Maneuver	-	-	-	-	896	-
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	966	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1532	-	-	-	900
HCM Lane V/C Ratio	-	-	-	-	0.056
HCM Control Delay (s)	0	-	-	-	9.2
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	0.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	4	13	184	167	4
Future Vol, veh/h	6	4	13	184	167	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	61	61	64	64
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	8	21	302	261	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	608	264	267	0	-	0
Stage 1	264	-	-	-	-	-
Stage 2	344	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	459	775	1297	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	718	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	450	775	1297	-	-	-
Mov Cap-2 Maneuver	450	-	-	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	718	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1297	-	541	-	-
HCM Lane V/C Ratio	0.016	-	0.037	-	-
HCM Control Delay (s)	7.8	0	11.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	232	860	0	0	995	296	370	0	308	0	0	0
Future Volume (veh/h)	232	860	0	0	995	296	370	0	308	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	294	1089	0	0	1131	336	440	0	367			
Peak Hour Factor	0.79	0.79	0.79	0.88	0.88	0.88	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	325	2011	0	0	932	273	316	0	264			
Arrive On Green	0.18	0.57	0.00	0.00	0.34	0.34	0.34	0.00	0.34			
Sat Flow, veh/h	1781	3647	0	0	2803	795	919	0	767			
Grp Volume(v), veh/h	294	1089	0	0	737	730	807	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1727	1686	0	0			
Q Serve(g_s), s	16.4	19.5	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	16.4	19.5	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.46	0.55		0.45			
Lane Grp Cap(c), veh/h	325	2011	0	0	611	594	580	0	0			
V/C Ratio(X)	0.90	0.54	0.00	0.00	1.21	1.23	1.39	0.00	0.00			
Avail Cap(c_a), veh/h	350	2060	0	0	611	594	580	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	40.7	13.8	0.0	0.0	33.4	33.4	33.4	0.0	0.0			
Incr Delay (d2), s/veh	24.7	0.5	0.0	0.0	107.4	117.7	186.7	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	9.3	7.3	0.0	0.0	32.6	33.4	43.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.5	14.3	0.0	0.0	140.8	151.1	220.1	0.0	0.0			
LnGrp LOS	E	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1383			1467			807				
Approach Delay, s/veh		25.2			145.9			220.1				
Approach LOS		C			F			F				

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		62.2			22.6	39.6		39.6
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0
Max Q Clear Time (g_c+I1), s		21.5			18.4	37.0		37.0
Green Ext Time (p_c), s		17.3			0.1	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	116.6
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	812	339	312	1053	0	0	0	0	280	4	198
Future Volume (veh/h)	0	812	339	312	1053	0	0	0	0	280	4	198
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1194	499	359	1210	0				311	4	220
Peak Hour Factor	0.68	0.68	0.68	0.87	0.87	0.87				0.90	0.90	0.90
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1211	504	348	1079	0				328	4	232
Arrive On Green	0.00	0.34	0.34	0.20	0.58	0.00				0.33	0.33	0.33
Sat Flow, veh/h	0	3705	1473	1781	1870	0				986	13	697
Grp Volume(v), veh/h	0	1149	544	359	1210	0				535	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1605	1781	1870	0				1696	0	0
Q Serve(g_s), s	0.0	34.3	34.5	20.0	59.0	0.0				31.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	34.3	34.5	20.0	59.0	0.0				31.4	0.0	0.0
Prop In Lane	0.00		0.92	1.00		0.00				0.58		0.41
Lane Grp Cap(c), veh/h	0	1165	550	348	1079	0				565	0	0
V/C Ratio(X)	0.00	0.99	0.99	1.03	1.12	0.00				0.95	0.00	0.00
Avail Cap(c_a), veh/h	0	1165	550	348	1079	0				580	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	33.4	33.4	41.1	21.6	0.0				33.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	23.0	35.7	56.2	67.0	0.0				24.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	17.2	18.3	14.0	42.9	0.0				15.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	56.4	69.2	97.3	88.7	0.0				58.1	0.0	0.0
LnGrp LOS	A	E	E	F	F	A				E	A	A
Approach Vol, veh/h		1693			1569						535	
Approach Delay, s/veh		60.5			90.6						58.1	
Approach LOS		E			F						E	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	24.0	39.6		38.6		63.6						
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6						
Max Green Setting (Gmax), s	20.0	35.0		35.0		59.0						
Max Q Clear Time (g_c+I1), s	22.0	36.5		33.4		61.0						
Green Ext Time (p_c), s	0.0	0.0		0.6		0.0						
Intersection Summary												
HCM 6th Ctrl Delay			72.6									
HCM 6th LOS			E									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	544	994	0	0	788	323	634	4	408	0	0	0
Future Volume (veh/h)	544	994	0	0	788	323	634	4	408	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	579	1057	0	0	838	0	755	5	486			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	391	1960	0	0	1017		602	4	539			
Arrive On Green	0.22	0.55	0.00	0.00	0.29	0.00	0.34	0.34	0.34			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1770	12	1585			
Grp Volume(v), veh/h	579	1057	0	0	838	0	760	0	486			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	20.0	17.3	0.0	0.0	20.1	0.0	31.0	0.0	26.6			
Cycle Q Clear(g_c), s	20.0	17.3	0.0	0.0	20.1	0.0	31.0	0.0	26.6			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	391	1960	0	0	1017		606	0	539			
V/C Ratio(X)	1.48	0.54	0.00	0.00	0.82		1.25	0.00	0.90			
Avail Cap(c_a), veh/h	391	2112	0	0	1169		606	0	539			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	35.6	13.1	0.0	0.0	30.4	0.0	30.1	0.0	28.7			
Incr Delay (d2), s/veh	230.4	0.3	0.0	0.0	4.7	0.0	127.8	0.0	18.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	[illegible]	5.9	0.0	0.0	8.6	0.0	33.6	0.0	12.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	266.0	13.4	0.0	0.0	35.1	0.0	158.0	0.0	47.1			
LnGrp LOS	F	B	A	A	D		F	A	D			
Approach Vol, veh/h		1636			838			1246				
Approach Delay, s/veh		102.8			35.1			114.7				
Approach LOS		F			D			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		55.6			24.2	31.4		35.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		19.3			22.0	22.1		33.0				
Green Ext Time (p_c), s		12.1			0.0	4.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	91.5
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1146	994	279	1143	0	0	0	0	392	6	412
Future Volume (veh/h)	0	1146	994	279	1143	0	0	0	0	392	6	412
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1232	1069	307	1256	0				467	7	490
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91				0.84	0.84	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1362	423	309	928	0				663	8	582
Arrive On Green	0.00	0.27	0.27	0.17	0.50	0.00				0.37	0.37	0.37
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	22	1566
Grp Volume(v), veh/h	0	1232	1069	307	1256	0				467	0	497
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1588
Q Serve(g_s), s	0.0	17.5	20.0	12.9	37.2	0.0				16.7	0.0	21.4
Cycle Q Clear(g_c), s	0.0	17.5	20.0	12.9	37.2	0.0				16.7	0.0	21.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1362	423	309	928	0				663	0	591
V/C Ratio(X)	0.00	0.90	2.53	0.99	1.35	0.00				0.70	0.00	0.84
Avail Cap(c_a), veh/h	0	1362	423	309	928	0				831	0	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.6	27.5	31.0	18.9	0.0				20.0	0.0	21.5
Incr Delay (d2), s/veh	0.0	8.8	694.9	49.6	166.3	0.0				2.2	0.0	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.5	88.4	9.3	55.6	0.0				6.4	0.0	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	35.4	722.4	80.6	185.2	0.0				22.3	0.0	29.0
LnGrp LOS	A	D	F	F	F	A				C	A	C
Approach Vol, veh/h		2301			1563						964	
Approach Delay, s/veh		354.6			164.6						25.8	
Approach LOS		F			F						C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	17.2	25.3		32.5		42.5
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3
Max Green Setting (Gmax), s	* 13	20.0		35.0		37.2
Max Q Clear Time (g_c+I1), s	14.9	22.0		23.4		39.2
Green Ext Time (p_c), s	0.0	0.0		4.4		0.0

Intersection Summary	
HCM 6th Ctrl Delay	227.4
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	410	71	635	407	341	264	146	314	325	49	41
Future Volume (veh/h)	83	410	71	635	407	341	264	146	314	325	49	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	90	719	125	794	509	371	314	159	374	353	53	45
Peak Hour Factor	0.92	0.57	0.57	0.80	0.80	0.92	0.84	0.92	0.84	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	1016	453	456	1205	538	360	347	518	235	409	182
Arrive On Green	0.08	0.29	0.29	0.13	0.34	0.34	0.20	0.19	0.19	0.13	0.12	0.12
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	90	719	125	794	509	371	314	159	374	353	53	45
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	3.7	13.7	4.6	10.0	8.4	15.3	12.9	5.7	9.6	10.0	1.0	2.0
Cycle Q Clear(g_c), s	3.7	13.7	4.6	10.0	8.4	15.3	12.9	5.7	9.6	10.0	1.0	2.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	140	1016	453	456	1205	538	360	347	518	235	409	182
V/C Ratio(X)	0.64	0.71	0.28	1.74	0.42	0.69	0.87	0.46	0.72	1.50	0.13	0.25
Avail Cap(c_a), veh/h	235	2342	1045	456	2342	1045	470	1233	1839	235	1874	836
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	24.3	21.0	32.9	19.3	21.6	29.3	27.5	29.1	32.9	30.2	30.6
Incr Delay (d2), s/veh	4.9	0.9	0.3	343.4	0.2	1.6	13.2	0.9	1.9	247.5	0.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	5.5	1.6	25.7	3.3	5.1	6.3	2.4	3.0	20.1	0.4	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.8	25.2	21.3	376.3	19.6	23.2	42.5	28.4	31.0	280.4	30.3	31.3
LnGrp LOS	D	C	C	F	B	C	D	C	C	F	C	C
Approach Vol, veh/h		934			1674			847			451	
Approach Delay, s/veh		26.0			189.6			34.8			226.1	
Approach LOS		C			F			C			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.6	26.8	19.9	14.5	10.5	30.8	14.6	19.9				
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8				
Max Green Setting (Gmax), s	10.0	50.0	20.0	* 40	10.0	50.0	10.0	50.0				
Max Q Clear Time (g_c+I1), s	12.0	15.7	14.9	4.0	5.7	17.3	12.0	11.6				
Green Ext Time (p_c), s	0.0	5.9	0.4	0.4	0.1	5.1	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			121.1									
HCM 6th LOS			F									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	13	264	64	22	21	247	629	30	40	440	53
Future Volume (veh/h)	75	13	264	64	22	21	247	629	30	40	440	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	129	22	455	128	44	42	291	740	35	62	677	82
Peak Hour Factor	0.58	0.58	0.58	0.50	0.50	0.50	0.85	0.85	0.85	0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	159	24	498	158	287	274	325	1617	76	104	923	111
Arrive On Green	0.09	0.33	0.33	0.09	0.33	0.33	0.18	0.32	0.32	0.06	0.20	0.20
Sat Flow, veh/h	1781	74	1523	1781	880	840	1781	4997	236	1781	4620	555
Grp Volume(v), veh/h	129	0	477	128	0	86	291	503	272	62	497	262
Grp Sat Flow(s),veh/h/ln	1781	0	1596	1781	0	1719	1781	1702	1828	1781	1702	1771
Q Serve(g_s), s	6.9	0.0	27.9	6.9	0.0	3.5	15.5	11.4	11.5	3.3	13.3	13.5
Cycle Q Clear(g_c), s	6.9	0.0	27.9	6.9	0.0	3.5	15.5	11.4	11.5	3.3	13.3	13.5
Prop In Lane	1.00		0.95	1.00		0.49	1.00		0.13	1.00		0.31
Lane Grp Cap(c), veh/h	159	0	522	158	0	561	325	1102	592	104	680	354
V/C Ratio(X)	0.81	0.00	0.91	0.81	0.00	0.15	0.90	0.46	0.46	0.60	0.73	0.74
Avail Cap(c_a), veh/h	183	0	574	183	0	618	366	1224	657	183	874	455
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	0.0	31.4	43.6	0.0	23.3	38.9	26.1	26.1	44.7	36.5	36.6
Incr Delay (d2), s/veh	21.1	0.0	18.9	20.8	0.0	0.2	22.0	0.4	0.8	5.3	2.8	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	13.3	3.9	0.0	1.4	8.3	4.3	4.8	1.5	5.5	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.6	0.0	50.3	64.4	0.0	23.4	60.9	26.5	26.9	50.0	39.3	42.3
LnGrp LOS	E	A	D	E	A	C	E	C	C	D	D	D
Approach Vol, veh/h		606			214			1066			821	
Approach Delay, s/veh		53.4			47.9			36.0			41.1	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	36.5	22.3	25.2	13.3	36.5	10.3	37.3
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	8.9	29.9	17.5	15.5	8.9	5.5	5.3	13.5
Green Ext Time (p_c), s	0.0	1.9	0.2	3.9	0.0	0.7	0.0	6.3

Intersection Summary		
HCM 6th Ctrl Delay		42.4
HCM 6th LOS		D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	495	1008	119	744	1143	352	170	234	468	560	194	337
Future Volume (veh/h)	495	1008	119	744	1143	352	170	234	468	560	194	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	589	1200	142	865	1329	409	191	263	526	848	294	511
Peak Hour Factor	0.84	0.84	0.84	0.86	0.86	0.86	0.89	0.89	0.89	0.66	0.66	0.66
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	612	1431	444	612	1431	444	217	1088	594	612	1371	426
Arrive On Green	0.18	0.28	0.28	0.18	0.28	0.28	0.12	0.21	0.21	0.18	0.27	0.27
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	589	1200	142	865	1329	409	191	263	526	848	294	511
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	23.9	31.2	10.0	25.0	35.7	35.3	14.9	6.0	25.8	25.0	6.3	37.9
Cycle Q Clear(g_c), s	23.9	31.2	10.0	25.0	35.7	35.3	14.9	6.0	25.8	25.0	6.3	37.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	612	1431	444	612	1431	444	217	1088	594	612	1371	426
V/C Ratio(X)	0.96	0.84	0.32	1.41	0.93	0.92	0.88	0.24	0.88	1.39	0.21	1.20
Avail Cap(c_a), veh/h	612	1447	449	612	1447	449	316	1266	692	612	1371	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.6	47.8	40.1	58.1	49.4	49.3	61.0	46.1	53.8	58.1	40.1	51.6
Incr Delay (d2), s/veh	27.1	4.5	0.4	195.4	10.7	24.1	17.6	0.1	11.8	183.3	0.1	110.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.5	13.5	3.9	27.3	16.2	16.6	7.7	2.5	9.8	26.2	2.6	27.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.7	52.3	40.6	253.4	60.1	73.4	78.6	46.2	65.7	241.4	40.1	162.5
LnGrp LOS	F	D	D	F	E	E	E	D	E	F	D	F
Approach Vol, veh/h		1931			2603			980			1653	
Approach Delay, s/veh		61.3			126.4			63.0			181.2	
Approach LOS		E			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	45.5	21.7	43.9	30.0	45.5	29.5	36.1
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	27.0	33.2	16.9	39.9	25.9	37.7	27.0	27.8
Green Ext Time (p_c), s	0.0	4.2	0.3	0.0	0.0	1.8	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	112.8
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	129	15	10	3	36	84	1	349	1	121	357	140
Future Volume (veh/h)	129	15	10	3	36	84	1	349	1	121	357	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	18	12	6	72	168	1	447	1	166	489	192
Peak Hour Factor	0.85	0.85	0.85	0.50	0.50	0.50	0.78	0.78	0.78	0.73	0.73	0.73
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	202	485	411	11	285	242	3	1197	3	218	1782	553
Arrive On Green	0.11	0.26	0.26	0.01	0.15	0.15	0.00	0.23	0.23	0.12	0.35	0.35
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5261	12	1781	5106	1585
Grp Volume(v), veh/h	152	18	12	6	72	168	1	289	159	166	489	192
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1868	1781	1702	1585
Q Serve(g_s), s	4.3	0.4	0.3	0.2	1.8	5.2	0.0	3.7	3.7	4.7	3.6	4.7
Cycle Q Clear(g_c), s	4.3	0.4	0.3	0.2	1.8	5.2	0.0	3.7	3.7	4.7	3.6	4.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	202	485	411	11	285	242	3	774	425	218	1782	553
V/C Ratio(X)	0.75	0.04	0.03	0.53	0.25	0.69	0.29	0.37	0.37	0.76	0.27	0.35
Avail Cap(c_a), veh/h	684	898	761	684	898	761	684	1961	1076	684	2942	913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	14.4	14.4	25.8	19.4	20.9	26.0	17.0	17.0	22.1	12.2	12.6
Incr Delay (d2), s/veh	5.6	0.0	0.0	33.0	0.5	3.6	41.5	1.1	2.0	5.4	0.3	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.2	0.1	0.2	0.8	1.9	0.1	1.3	1.6	2.0	1.1	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	14.4	14.4	58.8	19.9	24.5	67.5	18.1	19.0	27.5	12.5	13.9
LnGrp LOS	C	B	B	E	B	C	E	B	B	C	B	B
Approach Vol, veh/h		182			246			449			847	
Approach Delay, s/veh		25.8			24.0			18.5			15.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	18.5	4.6	24.2	10.4	12.9	10.9	17.8
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.2	2.4	2.0	6.7	6.3	7.2	6.7	5.7
Green Ext Time (p_c), s	0.0	0.1	0.0	8.9	0.3	0.9	0.3	6.1

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	1236	66	226	1212	212	23	35	216	165	36	27
Future Volume (veh/h)	63	1236	66	226	1212	212	23	35	216	165	36	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	1693	90	240	1289	226	25	38	232	217	47	36
Peak Hour Factor	0.73	0.73	0.73	0.94	0.94	0.94	0.93	0.93	0.93	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	1842	98	264	1629	727	41	306	260	243	272	209
Arrive On Green	0.06	0.37	0.37	0.15	0.46	0.46	0.02	0.16	0.16	0.14	0.28	0.28
Sat Flow, veh/h	1781	4963	264	1781	3554	1585	1781	1870	1585	1781	982	752
Grp Volume(v), veh/h	86	1161	622	240	1289	226	25	38	232	217	0	83
Grp Sat Flow(s),veh/h/ln	1781	1702	1823	1781	1777	1585	1781	1870	1585	1781	0	1735
Q Serve(g_s), s	6.2	42.2	42.3	17.2	40.0	11.7	1.8	2.2	18.6	15.5	0.0	4.7
Cycle Q Clear(g_c), s	6.2	42.2	42.3	17.2	40.0	11.7	1.8	2.2	18.6	15.5	0.0	4.7
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	109	1263	676	264	1629	727	41	306	260	243	0	481
V/C Ratio(X)	0.79	0.92	0.92	0.91	0.79	0.31	0.61	0.12	0.89	0.89	0.00	0.17
Avail Cap(c_a), veh/h	275	1312	703	275	1629	727	275	433	367	275	0	481
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	60.1	38.9	38.9	54.4	29.9	22.2	62.8	46.3	53.1	55.1	0.0	35.6
Incr Delay (d2), s/veh	11.9	10.0	16.6	30.8	2.9	0.3	14.0	0.2	18.0	26.8	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	19.0	21.6	9.8	16.8	4.4	1.0	1.1	8.6	8.7	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.0	48.9	55.5	85.2	32.7	22.5	76.8	46.5	71.1	81.9	0.0	35.8
LnGrp LOS	E	D	E	F	C	C	E	D	E	F	A	D
Approach Vol, veh/h		1869			1755			295			300	
Approach Delay, s/veh		52.2			38.6			68.4			69.1	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.6	54.1	8.6	42.5	13.2	65.5	23.3	27.7
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	19.2	44.3	3.8	6.7	8.2	42.0	17.5	20.6
Green Ext Time (p_c), s	0.1	3.8	0.0	0.4	0.1	6.2	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	48.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	0	4	45	115	8	28	37	64	89	25	40	0
Future Vol, veh/h	0	4	45	115	8	28	37	64	89	25	40	0
Peak Hour Factor	0.61	0.61	0.61	0.54	0.54	0.54	0.75	0.75	0.75	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	74	213	15	52	49	85	119	30	48	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	10.9	10	8.9
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	0%	76%	38%
Vol Thru, %	34%	8%	5%	62%
Vol Right, %	47%	92%	19%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	190	49	151	65
LT Vol	37	0	115	25
Through Vol	64	4	8	40
RT Vol	89	45	28	0
Lane Flow Rate	253	80	280	78
Geometry Grp	1	1	1	1
Degree of Util (X)	0.328	0.101	0.378	0.113
Departure Headway (Hd)	4.662	4.538	4.86	5.2
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	765	781	735	683
Service Time	2.724	2.617	2.922	3.278
HCM Lane V/C Ratio	0.331	0.102	0.381	0.114
HCM Control Delay	10	8.1	10.9	8.9
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	1.4	0.3	1.8	0.4

Intersection						
Int Delay, s/veh	2.3					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	24	11	26	27	3
Future Vol, veh/h	0	24	11	26	27	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	50	71	71	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	48	15	37	31	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	52	0	-	0	82	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	48	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1554	-	-	-	920	1039
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	974	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1554	-	-	-	920	1039
Mov Cap-2 Maneuver	-	-	-	-	920	-
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	974	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1554	-	-	-	931
HCM Lane V/C Ratio	-	-	-	-	0.037
HCM Control Delay (s)	0	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	9	12	142	171	5
Future Vol, veh/h	9	9	12	142	171	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	57	57	75	75	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	16	16	189	323	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	549	328	332	0	-	0
Stage 1	328	-	-	-	-	-
Stage 2	221	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	497	713	1227	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	816	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	490	713	1227	-	-	-
Mov Cap-2 Maneuver	490	-	-	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	816	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1227	-	581	-	-
HCM Lane V/C Ratio	0.013	-	0.054	-	-
HCM Control Delay (s)	8	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	251	1048	0	0	1038	275	365	5	424	0	0	0
Future Volume (veh/h)	251	1048	0	0	1038	275	365	5	424	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	326	1361	0	0	1166	309	435	6	505			
Peak Hour Factor	0.77	0.77	0.77	0.89	0.89	0.89	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	345	2032	0	0	945	247	261	4	303			
Arrive On Green	0.19	0.57	0.00	0.00	0.34	0.34	0.34	0.34	0.34			
Sat Flow, veh/h	1781	3647	0	0	2880	730	769	11	892			
Grp Volume(v), veh/h	326	1361	0	0	738	737	946	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1739	1671	0	0			
Q Serve(g_s), s	18.6	27.4	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	18.6	27.4	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.42	0.46		0.53			
Lane Grp Cap(c), veh/h	345	2032	0	0	603	590	567	0	0			
V/C Ratio(X)	0.94	0.67	0.00	0.00	1.23	1.25	1.67	0.00	0.00			
Avail Cap(c_a), veh/h	345	2032	0	0	603	590	567	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	41.1	15.3	0.0	0.0	34.1	34.1	34.1	0.0	0.0			
Incr Delay (d2), s/veh	34.2	1.1	0.0	0.0	115.7	125.6	308.7	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.3	10.4	0.0	0.0	33.8	34.7	61.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.2	16.4	0.0	0.0	149.8	159.7	342.8	0.0	0.0			
LnGrp LOS	E	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1687			1475			946				
Approach Delay, s/veh		27.8			154.7			342.8				
Approach LOS		C			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		63.6			24.0	39.6		39.6				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0				
Max Q Clear Time (g_c+I1), s		29.4			20.6	37.0		37.0				
Green Ext Time (p_c), s		19.5			0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			145.9									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	946	409	287	1116	0	0	0	0	353	8	267
Future Volume (veh/h)	0	946	409	287	1116	0	0	0	0	353	8	267
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1296	560	322	1254	0				406	9	307
Peak Hour Factor	0.73	0.73	0.73	0.89	0.89	0.89				0.87	0.87	0.87
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1189	508	345	1069	0				323	7	244
Arrive On Green	0.00	0.34	0.34	0.19	0.57	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	3674	1499	1781	1870	0				952	21	720
Grp Volume(v), veh/h	0	1258	598	322	1254	0				722	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1601	1781	1870	0				1693	0	0
Q Serve(g_s), s	0.0	35.0	35.0	18.4	59.0	0.0				35.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	35.0	35.0	18.4	59.0	0.0				35.0	0.0	0.0
Prop In Lane	0.00		0.94	1.00		0.00				0.56		0.43
Lane Grp Cap(c), veh/h	0	1154	543	345	1069	0				574	0	0
V/C Ratio(X)	0.00	1.09	1.10	0.93	1.17	0.00				1.26	0.00	0.00
Avail Cap(c_a), veh/h	0	1154	543	345	1069	0				574	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	34.1	34.1	40.9	22.1	0.0				34.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	54.4	69.4	31.6	87.8	0.0				129.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	22.6	23.5	10.9	49.0	0.0				34.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	88.5	103.5	72.6	109.9	0.0				163.6	0.0	0.0
LnGrp LOS	A	F	F	E	F	A				F	A	A
Approach Vol, veh/h		1856			1576						722	
Approach Delay, s/veh		93.3			102.3						163.6	
Approach LOS		F			F						F	

Timer - Assigned Phs	1	2	4	6
Phs Duration (G+Y+Rc), s	24.0	39.6	39.6	63.6
Change Period (Y+Rc), s	4.0	4.6	4.6	4.6
Max Green Setting (Gmax), s	20.0	35.0	35.0	59.0
Max Q Clear Time (g_c+I1), s	20.4	37.0	37.0	61.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	109.0
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	446	1172	0	0	1106	567	1074	6	469	0	0	0
Future Volume (veh/h)	446	1172	0	0	1106	567	1074	6	469	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	480	1260	0	0	1152	0	1119	6	489			
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	375	2025	0	0	1121		578	3	517			
Arrive On Green	0.21	0.57	0.00	0.00	0.32	0.00	0.33	0.33	0.33			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1772	10	1585			
Grp Volume(v), veh/h	480	1260	0	0	1152	0	1125	0	489			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	20.0	22.5	0.0	0.0	30.0	0.0	31.0	0.0	28.6			
Cycle Q Clear(g_c), s	20.0	22.5	0.0	0.0	30.0	0.0	31.0	0.0	28.6			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	375	2025	0	0	1121		581	0	517			
V/C Ratio(X)	1.28	0.62	0.00	0.00	1.03		1.94	0.00	0.95			
Avail Cap(c_a), veh/h	375	2025	0	0	1121		581	0	517			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	37.5	13.6	0.0	0.0	32.5	0.0	32.1	0.0	31.2			
Incr Delay (d2), s/veh	145.6	0.7	0.0	0.0	34.2	0.0	428.0	0.0	26.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	28.3	7.8	0.0	0.0	17.2	0.0	81.3	0.0	13.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	183.2	14.3	0.0	0.0	66.7	0.0	460.0	0.0	58.0			
LnGrp LOS	F	B	A	A	F		F	A	E			
Approach Vol, veh/h		1740			1152			1614				
Approach Delay, s/veh		60.9			66.7			338.2				
Approach LOS		E			E			F				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		59.5			24.2	35.3		35.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		24.5			22.0	32.0		33.0				
Green Ext Time (p_c), s		14.3			0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	161.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1255	887	300	1880	0	0	0	0	363	1	517
Future Volume (veh/h)	0	1255	887	300	1880	0	0	0	0	363	1	517
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1364	964	316	1979	0				491	1	699
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95				0.74	0.74	0.74
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1244	386	282	847	0				759	1	675
Arrive On Green	0.00	0.24	0.24	0.16	0.45	0.00				0.43	0.43	0.43
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	2	1583
Grp Volume(v), veh/h	0	1364	964	316	1979	0				491	0	700
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1585
Q Serve(g_s), s	0.0	20.0	20.0	13.0	37.2	0.0				17.9	0.0	35.0
Cycle Q Clear(g_c), s	0.0	20.0	20.0	13.0	37.2	0.0				17.9	0.0	35.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1244	386	282	847	0				759	0	676
V/C Ratio(X)	0.00	1.10	2.50	1.12	2.34	0.00				0.65	0.00	1.04
Avail Cap(c_a), veh/h	0	1244	386	282	847	0				759	0	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.1	31.0	34.5	22.4	0.0				18.7	0.0	23.6
Incr Delay (d2), s/veh	0.0	56.2	681.2	89.9	604.5	0.0				2.0	0.0	44.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.0	80.0	12.3	156.1	0.0				6.9	0.0	19.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	87.2	712.2	124.5	627.0	0.0				20.7	0.0	67.7
LnGrp LOS	A	F	F	F	F	A				C	A	F
Approach Vol, veh/h		2328			2295						1191	
Approach Delay, s/veh		346.0			557.8						48.3	
Approach LOS		F			F						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	17.2	25.3		39.6		42.5
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3
Max Green Setting (Gmax), s	* 13	20.0		35.0		37.2
Max Q Clear Time (g_c+I1), s	15.0	22.0		37.0		39.2
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	368.6
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix G – 2026 Baseline Conditions plus Project Level of Service Sheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	628	65	477	405	376	265	47	300	128	29	21
Future Volume (veh/h)	51	628	65	477	405	376	265	47	300	128	29	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	981	102	530	450	409	353	51	400	139	32	23
Peak Hour Factor	0.92	0.64	0.64	0.90	0.90	0.92	0.75	0.92	0.75	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	1273	568	391	1467	654	387	383	571	172	298	133
Arrive On Green	0.06	0.36	0.36	0.11	0.41	0.41	0.22	0.20	0.20	0.10	0.08	0.08
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	55	981	102	530	450	409	353	51	400	139	32	23
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	2.7	21.6	3.9	10.0	7.5	18.0	17.1	2.0	11.8	6.8	0.7	1.2
Cycle Q Clear(g_c), s	2.7	21.6	3.9	10.0	7.5	18.0	17.1	2.0	11.8	6.8	0.7	1.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	1273	568	391	1467	654	387	383	571	172	298	133
V/C Ratio(X)	0.53	0.77	0.18	1.36	0.31	0.63	0.91	0.13	0.70	0.81	0.11	0.17
Avail Cap(c_a), veh/h	202	2011	897	391	2011	897	403	1058	1579	202	1609	718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	25.1	19.4	39.2	17.4	20.5	33.8	28.7	32.6	39.1	37.4	37.6
Incr Delay (d2), s/veh	4.1	1.0	0.1	175.8	0.1	1.0	24.1	0.2	1.6	18.9	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	8.7	1.3	13.7	2.9	6.0	9.4	0.8	3.8	3.8	0.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.4	26.2	19.6	215.0	17.6	21.5	57.8	28.9	34.2	58.0	37.6	38.2
LnGrp LOS	D	C	B	F	B	C	E	C	C	E	D	D
Approach Vol, veh/h		1138			1389			804			194	
Approach Delay, s/veh		26.5			94.1			44.2			52.3	
Approach LOS		C			F			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.6	36.8	23.8	13.2	9.8	41.6	13.1	23.9				
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8				
Max Green Setting (Gmax), s	10.0	50.0	20.0	* 40	10.0	50.0	10.0	50.0				
Max Q Clear Time (g_c+I1), s	12.0	23.6	19.1	3.2	4.7	20.0	8.8	13.8				
Green Ext Time (p_c), s	0.0	8.0	0.1	0.2	0.0	4.7	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay			58.6									
HCM 6th LOS			E									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	3	312	21	2	9	115	534	5	21	288	56
Future Volume (veh/h)	120	3	312	21	2	9	115	534	5	21	288	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	203	5	529	42	4	18	153	712	7	31	424	82
Peak Hour Factor	0.59	0.59	0.59	0.50	0.50	0.50	0.75	0.75	0.75	0.68	0.68	0.68
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	243	6	614	99	92	412	196	1225	12	80	734	138
Arrive On Green	0.14	0.39	0.39	0.06	0.31	0.31	0.11	0.23	0.23	0.04	0.17	0.17
Sat Flow, veh/h	1781	15	1572	1781	296	1334	1781	5214	51	1781	4316	813
Grp Volume(v), veh/h	203	0	534	42	0	22	153	465	254	31	332	174
Grp Sat Flow(s),veh/h/ln	1781	0	1587	1781	0	1630	1781	1702	1861	1781	1702	1724
Q Serve(g_s), s	8.0	0.0	22.2	1.6	0.0	0.7	6.0	8.7	8.7	1.2	6.4	6.7
Cycle Q Clear(g_c), s	8.0	0.0	22.2	1.6	0.0	0.7	6.0	8.7	8.7	1.2	6.4	6.7
Prop In Lane	1.00		0.99	1.00		0.82	1.00		0.03	1.00		0.47
Lane Grp Cap(c), veh/h	243	0	620	99	0	504	196	800	437	80	579	293
V/C Ratio(X)	0.83	0.00	0.86	0.43	0.00	0.04	0.78	0.58	0.58	0.39	0.57	0.59
Avail Cap(c_a), veh/h	248	0	774	248	0	795	496	1660	907	248	1186	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	0.0	20.1	32.8	0.0	17.4	31.1	24.3	24.3	33.3	27.4	27.5
Incr Delay (d2), s/veh	20.9	0.0	9.0	2.9	0.0	0.1	6.7	1.0	1.7	3.0	1.3	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	9.2	0.8	0.0	0.3	2.7	3.2	3.6	0.5	2.4	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.1	0.0	29.1	35.7	0.0	17.4	37.8	25.3	26.1	36.4	28.7	30.2
LnGrp LOS	D	A	C	D	A	B	D	C	C	D	C	C
Approach Vol, veh/h		737			64			872			537	
Approach Delay, s/veh		35.2			29.4			27.7			29.6	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	32.7	12.5	18.0	14.4	26.9	7.8	22.7
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	3.6	24.2	8.0	8.7	10.0	2.7	3.2	10.7
Green Ext Time (p_c), s	0.0	3.8	0.3	3.5	0.0	0.1	0.0	6.0

Intersection Summary		
HCM 6th Ctrl Delay		30.7
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	326	1440	74	495	684	161	84	199	479	531	144	180
Future Volume (veh/h)	326	1440	74	495	684	161	84	199	479	531	144	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	384	1694	87	589	814	192	101	240	577	805	218	273
Peak Hour Factor	0.85	0.85	0.85	0.84	0.84	0.84	0.83	0.83	0.83	0.66	0.66	0.66
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	444	1418	440	600	1648	512	124	1154	631	600	1684	523
Arrive On Green	0.13	0.28	0.28	0.17	0.32	0.32	0.07	0.23	0.23	0.17	0.33	0.33
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	384	1694	87	589	814	192	101	240	577	805	218	273
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	15.7	40.0	6.0	24.5	18.5	13.4	8.1	5.5	29.1	25.0	4.3	20.1
Cycle Q Clear(g_c), s	15.7	40.0	6.0	24.5	18.5	13.4	8.1	5.5	29.1	25.0	4.3	20.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	444	1418	440	600	1648	512	124	1154	631	600	1684	523
V/C Ratio(X)	0.87	1.19	0.20	0.98	0.49	0.38	0.81	0.21	0.91	1.34	0.13	0.52
Avail Cap(c_a), veh/h	600	1418	440	600	1648	512	309	1240	678	600	1684	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.6	52.0	39.8	59.3	39.3	37.6	66.1	45.3	54.4	59.5	33.8	39.1
Incr Delay (d2), s/veh	9.8	94.9	0.2	32.1	0.2	0.5	11.9	0.1	16.5	165.1	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	29.0	2.4	13.2	7.6	5.2	4.0	2.3	11.4	24.4	1.8	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.3	146.9	40.0	91.4	39.5	38.0	78.0	45.4	70.9	224.6	33.8	40.0
LnGrp LOS	E	F	D	F	D	D	E	D	E	F	C	D
Approach Vol, veh/h		2165			1595			918			1296	
Approach Delay, s/veh		129.2			58.5			65.0			153.6	
Approach LOS		F			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	46.0	14.6	53.5	23.5	52.5	29.5	38.6
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	26.5	42.0	10.1	22.1	17.7	20.5	27.0	31.1
Green Ext Time (p_c), s	0.0	0.0	0.2	1.8	0.8	5.7	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	105.8
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	237	38	15	3	19	94	5	313	6	77	335	99
Future Volume (veh/h)	237	38	15	3	19	94	5	313	6	77	335	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	308	49	19	4	23	116	6	373	7	104	453	134
Peak Hour Factor	0.77	0.77	0.77	0.81	0.81	0.81	0.84	0.84	0.84	0.74	0.74	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	602	510	8	209	177	11	1049	20	137	1399	434
Arrive On Green	0.21	0.32	0.32	0.00	0.11	0.11	0.01	0.20	0.20	0.08	0.27	0.27
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5161	97	1781	5106	1585
Grp Volume(v), veh/h	308	49	19	4	23	116	6	246	134	104	453	134
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1853	1781	1702	1585
Q Serve(g_s), s	8.3	0.9	0.4	0.1	0.6	3.6	0.2	3.1	3.2	2.9	3.6	3.4
Cycle Q Clear(g_c), s	8.3	0.9	0.4	0.1	0.6	3.6	0.2	3.1	3.2	2.9	3.6	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	381	602	510	8	209	177	11	692	377	137	1399	434
V/C Ratio(X)	0.81	0.08	0.04	0.52	0.11	0.65	0.53	0.36	0.36	0.76	0.32	0.31
Avail Cap(c_a), veh/h	701	920	780	701	920	780	701	2010	1094	701	3015	936
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	12.0	11.8	25.2	20.3	21.6	25.2	17.4	17.4	23.0	14.7	14.6
Incr Delay (d2), s/veh	4.1	0.1	0.0	45.2	0.2	4.0	32.9	1.1	2.1	8.2	0.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.4	0.1	0.1	0.2	1.3	0.2	1.1	1.3	1.4	1.2	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.1	12.1	11.9	70.4	20.5	25.7	58.1	18.5	19.5	31.2	15.2	16.1
LnGrp LOS	C	B	B	E	C	C	E	B	B	C	B	B
Approach Vol, veh/h		376			143			386			691	
Approach Delay, s/veh		21.1			26.1			19.5			17.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	21.3	4.8	19.9	15.4	10.7	8.4	16.3
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	2.9	2.2	5.6	10.3	5.6	4.9	5.2
Green Ext Time (p_c), s	0.0	0.2	0.0	7.9	0.7	0.4	0.2	5.2

Intersection Summary	
HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	1389	48	130	724	92	44	141	239	198	137	67
Future Volume (veh/h)	47	1389	48	130	724	92	44	141	239	198	137	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	1578	55	157	872	111	56	181	306	360	249	122
Peak Hour Factor	0.88	0.88	0.88	0.83	0.83	0.83	0.78	0.78	0.78	0.55	0.55	0.55
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	1778	62	184	1477	659	73	393	333	275	384	188
Arrive On Green	0.04	0.35	0.35	0.10	0.42	0.42	0.04	0.21	0.21	0.15	0.32	0.32
Sat Flow, veh/h	1781	5066	177	1781	3554	1585	1781	1870	1585	1781	1185	581
Grp Volume(v), veh/h	53	1060	573	157	872	111	56	181	306	360	0	371
Grp Sat Flow(s),veh/h/ln	1781	1702	1839	1781	1777	1585	1781	1870	1585	1781	0	1766
Q Serve(g_s), s	3.8	38.0	38.0	11.2	24.6	5.7	4.0	10.9	24.4	20.0	0.0	23.3
Cycle Q Clear(g_c), s	3.8	38.0	38.0	11.2	24.6	5.7	4.0	10.9	24.4	20.0	0.0	23.3
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	69	1195	645	184	1477	659	73	393	333	275	0	572
V/C Ratio(X)	0.77	0.89	0.89	0.85	0.59	0.17	0.77	0.46	0.92	1.31	0.00	0.65
Avail Cap(c_a), veh/h	275	1316	711	275	1477	659	275	434	368	275	0	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	61.6	39.6	39.6	57.0	29.3	23.8	61.4	44.7	50.0	54.7	0.0	37.4
Incr Delay (d2), s/veh	16.2	6.7	11.5	15.1	0.8	0.2	15.5	0.8	26.2	161.9	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	16.7	18.9	5.7	10.2	2.2	2.1	5.2	12.0	21.3	0.0	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.8	46.3	51.1	72.1	30.0	23.9	76.9	45.5	76.1	216.6	0.0	40.0
LnGrp LOS	E	D	D	E	C	C	E	D	E	F	A	D
Approach Vol, veh/h		1686			1140			543			731	
Approach Delay, s/veh		48.9			35.2			66.0			126.9	
Approach LOS		D			D			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.7	51.4	10.9	48.4	10.3	59.7	25.6	33.7
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	13.2	40.0	6.0	25.3	5.8	26.6	22.0	26.4
Green Ext Time (p_c), s	0.2	5.4	0.1	0.9	0.1	8.8	0.0	0.8

Intersection Summary		
HCM 6th Ctrl Delay		61.3
HCM 6th LOS		E

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	14.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	25	54	131	9	21	38	87	126	37	122	0
Future Vol, veh/h	0	25	54	131	9	21	38	87	126	37	122	0
Peak Hour Factor	0.75	0.75	0.75	0.59	0.59	0.59	0.63	0.63	0.63	0.53	0.53	0.53
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	33	72	222	15	36	60	138	200	70	230	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.5	14.5	16.1	14.3
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	0%	81%	23%
Vol Thru, %	35%	32%	6%	77%
Vol Right, %	50%	68%	13%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	251	79	161	159
LT Vol	38	0	131	37
Through Vol	87	25	9	122
RT Vol	126	54	21	0
Lane Flow Rate	398	105	273	300
Geometry Grp	1	1	1	1
Degree of Util (X)	0.593	0.18	0.464	0.484
Departure Headway (Hd)	5.356	6.159	6.127	5.803
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	669	586	584	615
Service Time	3.441	4.159	4.218	3.895
HCM Lane V/C Ratio	0.595	0.179	0.467	0.488
HCM Control Delay	16.1	10.5	14.5	14.3
HCM Lane LOS	C	B	B	B
HCM 95th-tile Q	3.9	0.7	2.4	2.6

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	38	0	3	17	27	0	0	9	31	0	1
Future Vol, veh/h	0	38	0	3	17	27	0	0	9	31	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	71	71	71	100	100	100	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	76	0	4	24	38	0	0	9	35	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	62	0	0	76	0	0	128	146	76	132	127	43
Stage 1	-	-	-	-	-	-	76	76	-	51	51	-
Stage 2	-	-	-	-	-	-	52	70	-	81	76	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1541	-	-	1523	-	-	845	745	985	840	764	1027
Stage 1	-	-	-	-	-	-	933	832	-	962	852	-
Stage 2	-	-	-	-	-	-	961	837	-	927	832	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1541	-	-	1523	-	-	842	743	985	831	762	1027
Mov Cap-2 Maneuver	-	-	-	-	-	-	842	743	-	831	762	-
Stage 1	-	-	-	-	-	-	933	832	-	962	849	-
Stage 2	-	-	-	-	-	-	957	834	-	919	832	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	8.7	9.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	985	1541	-	-	1523	-	-	836
HCM Lane V/C Ratio	0.009	-	-	-	0.003	-	-	0.043
HCM Control Delay (s)	8.7	0	-	-	7.4	0	-	9.5
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	4	13	208	175	4
Future Vol, veh/h	6	4	13	208	175	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	50	50	61	61	64	64
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	8	21	341	273	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	659	276	279	0	-	0
Stage 1	276	-	-	-	-	-
Stage 2	383	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	429	763	1284	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	420	763	1284	-	-	-
Mov Cap-2 Maneuver	420	-	-	-	-	-
Stage 1	756	-	-	-	-	-
Stage 2	689	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1284	-	512	-	-
HCM Lane V/C Ratio	0.017	-	0.039	-	-
HCM Control Delay (s)	7.9	0	12.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	13	47	14	24	17
Future Vol, veh/h	5	13	47	14	24	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	13	47	14	24	17

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	119	54	0	0	61	0
Stage 1	54	-	-	-	-	-
Stage 2	65	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	877	1013	-	-	1542	-
Stage 1	969	-	-	-	-	-
Stage 2	958	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	863	1013	-	-	1542	-
Mov Cap-2 Maneuver	863	-	-	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	943	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	4.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	966	1542	-
HCM Lane V/C Ratio	-	-	0.019	0.016	-
HCM Control Delay (s)	-	-	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	152.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	1154	719	116	330	71
Future Vol, veh/h	25	1154	719	116	330	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	1154	719	116	330	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	835	0	-	0	1404	418
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	627	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	794	-	-	-	~ 131	584
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	495	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	794	-	-	-	~ 119	584
Mov Cap-2 Maneuver	-	-	-	-	~ 119	-
Stage 1	-	-	-	-	378	-
Stage 2	-	-	-	-	495	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	$ 917
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	794	-	-	-	139
HCM Lane V/C Ratio	0.031	-	-	-	2.885
HCM Control Delay (s)	9.7	0.4	-	-	$ 917
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	36.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	279	884	0	0	1003	296	370	0	308	0	0	0
Future Volume (veh/h)	279	884	0	0	1003	296	370	0	308	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	353	1119	0	0	1140	336	440	0	367			
Peak Hour Factor	0.79	0.79	0.79	0.88	0.88	0.88	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	345	2032	0	0	921	268	312	0	260			
Arrive On Green	0.19	0.57	0.00	0.00	0.34	0.34	0.34	0.00	0.34			
Sat Flow, veh/h	1781	3647	0	0	2809	790	919	0	767			
Grp Volume(v), veh/h	353	1119	0	0	741	735	807	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1728	1686	0	0			
Q Serve(g_s), s	20.0	20.3	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	20.0	20.3	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.46	0.55		0.45			
Lane Grp Cap(c), veh/h	345	2032	0	0	603	586	572	0	0			
V/C Ratio(X)	1.02	0.55	0.00	0.00	1.23	1.25	1.41	0.00	0.00			
Avail Cap(c_a), veh/h	345	2032	0	0	603	586	572	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	41.6	13.8	0.0	0.0	34.1	34.1	34.1	0.0	0.0			
Incr Delay (d2), s/veh	54.3	0.5	0.0	0.0	117.2	128.1	195.2	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	13.8	7.6	0.0	0.0	34.0	34.9	44.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.9	14.3	0.0	0.0	151.3	162.2	229.3	0.0	0.0			
LnGrp LOS	F	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1472			1476			807				
Approach Delay, s/veh		33.9			156.7			229.3				
Approach LOS		C			F			F				

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		63.6			24.0	39.6		39.6
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0
Max Q Clear Time (g_c+I1), s		22.3			22.0	37.0		37.0
Green Ext Time (p_c), s		17.7			0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	124.2
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	883	339	312	1061	0	0	0	0	280	4	215
Future Volume (veh/h)	0	883	339	312	1061	0	0	0	0	280	4	215
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1299	499	359	1220	0				311	4	239
Peak Hour Factor	0.68	0.68	0.68	0.87	0.87	0.87				0.90	0.90	0.90
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1233	471	345	1069	0				322	4	247
Arrive On Green	0.00	0.34	0.34	0.19	0.57	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	3805	1388	1781	1870	0				950	12	730
Grp Volume(v), veh/h	0	1215	583	359	1220	0				554	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1621	1781	1870	0				1692	0	0
Q Serve(g_s), s	0.0	35.0	35.0	20.0	59.0	0.0				33.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	35.0	35.0	20.0	59.0	0.0				33.2	0.0	0.0
Prop In Lane	0.00		0.86	1.00		0.00				0.56		0.43
Lane Grp Cap(c), veh/h	0	1154	550	345	1069	0				574	0	0
V/C Ratio(X)	0.00	1.05	1.06	1.04	1.14	0.00				0.97	0.00	0.00
Avail Cap(c_a), veh/h	0	1154	550	345	1069	0				574	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	34.1	34.1	41.6	22.1	0.0				33.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	41.5	55.4	59.2	75.0	0.0				29.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	20.5	21.6	14.2	45.1	0.0				17.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	75.6	89.5	100.8	97.1	0.0				62.6	0.0	0.0
LnGrp LOS	A	F	F	F	F	A				E	A	A
Approach Vol, veh/h		1798			1579						554	
Approach Delay, s/veh		80.1			97.9						62.6	
Approach LOS		F			F						E	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	24.0	39.6		39.6		63.6						
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6						
Max Green Setting (Gmax), s	20.0	35.0		35.0		59.0						
Max Q Clear Time (g_c+I1), s	22.0	37.0		35.2		61.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0						
Intersection Summary												
HCM 6th Ctrl Delay			84.8									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	662	1065	0	0	813	323	684	4	408	0	0	0
Future Volume (veh/h)	662	1065	0	0	813	323	684	4	408	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	704	1133	0	0	865	0	814	5	486			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	388	1971	0	0	1034		598	4	535			
Arrive On Green	0.22	0.55	0.00	0.00	0.29	0.00	0.34	0.34	0.34			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1771	11	1585			
Grp Volume(v), veh/h	704	1133	0	0	865	0	819	0	486			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	20.0	19.1	0.0	0.0	20.9	0.0	31.0	0.0	26.9			
Cycle Q Clear(g_c), s	20.0	19.1	0.0	0.0	20.9	0.0	31.0	0.0	26.9			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	388	1971	0	0	1034		602	0	535			
V/C Ratio(X)	1.81	0.57	0.00	0.00	0.84		1.36	0.00	0.91			
Avail Cap(c_a), veh/h	388	2097	0	0	1161		602	0	535			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	35.9	13.4	0.0	0.0	30.5	0.0	30.4	0.0	29.1			
Incr Delay (d2), s/veh	376.7	0.4	0.0	0.0	5.4	0.0	173.3	0.0	19.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	48.7	6.6	0.0	0.0	9.1	0.0	41.1	0.0	12.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	412.6	13.8	0.0	0.0	35.9	0.0	203.7	0.0	48.5			
LnGrp LOS	F	B	A	A	D		F	A	D			
Approach Vol, veh/h		1837			865			1305				
Approach Delay, s/veh		166.6			35.9			145.9				
Approach LOS		F			D			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		56.2			24.2	32.0		35.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		21.1			22.0	22.9		33.0				
Green Ext Time (p_c), s		13.0			0.0	3.8		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			131.6									
HCM 6th LOS			F									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1335	1136	279	1218	0	0	0	0	392	6	454
Future Volume (veh/h)	0	1335	1136	279	1218	0	0	0	0	392	6	454
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1435	1222	307	1338	0				467	7	540
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91				0.84	0.84	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1315	408	298	896	0				701	8	617
Arrive On Green	0.00	0.26	0.26	0.17	0.48	0.00				0.39	0.39	0.39
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	20	1568
Grp Volume(v), veh/h	0	1435	1222	307	1338	0				467	0	547
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1588
Q Serve(g_s), s	0.0	20.0	20.0	13.0	37.2	0.0				16.7	0.0	24.7
Cycle Q Clear(g_c), s	0.0	20.0	20.0	13.0	37.2	0.0				16.7	0.0	24.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	1315	408	298	896	0				701	0	625
V/C Ratio(X)	0.00	1.09	2.99	1.03	1.49	0.00				0.67	0.00	0.87
Avail Cap(c_a), veh/h	0	1315	408	298	896	0				803	0	716
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	28.8	28.8	32.3	20.2	0.0				19.4	0.0	21.8
Incr Delay (d2), s/veh	0.0	53.7	904.1	60.0	228.1	0.0				1.9	0.0	11.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.9	109.3	10.1	70.0	0.0				6.4	0.0	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	82.6	932.9	92.4	248.4	0.0				21.3	0.0	32.8
LnGrp LOS	A	F	F	F	F	A				C	A	C
Approach Vol, veh/h		2657			1645						1014	
Approach Delay, s/veh		473.6			219.3						27.5	
Approach LOS		F			F						C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	17.2	25.3		35.2		42.5
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3
Max Green Setting (Gmax), s	* 13	20.0		35.0		37.2
Max Q Clear Time (g_c+I1), s	15.0	22.0		26.7		39.2
Green Ext Time (p_c), s	0.0	0.0		3.8		0.0

Intersection Summary		
HCM 6th Ctrl Delay		309.8
HCM 6th LOS		F

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	442	71	662	461	341	264	146	330	325	49	41
Future Volume (veh/h)	83	442	71	662	461	341	264	146	330	325	49	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	90	775	125	828	576	371	314	159	393	353	53	45
Peak Hour Factor	0.92	0.57	0.57	0.80	0.80	0.92	0.84	0.92	0.84	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	136	1073	478	439	1252	559	358	353	527	226	408	182
Arrive On Green	0.08	0.30	0.30	0.13	0.35	0.35	0.20	0.19	0.19	0.13	0.11	0.11
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	90	775	125	828	576	371	314	159	393	353	53	45
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	3.9	15.3	4.7	10.0	9.9	15.6	13.5	5.9	10.5	10.0	1.1	2.0
Cycle Q Clear(g_c), s	3.9	15.3	4.7	10.0	9.9	15.6	13.5	5.9	10.5	10.0	1.1	2.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	136	1073	478	439	1252	559	358	353	527	226	408	182
V/C Ratio(X)	0.66	0.72	0.26	1.89	0.46	0.66	0.88	0.45	0.75	1.56	0.13	0.25
Avail Cap(c_a), veh/h	226	2256	1006	439	2256	1006	452	1187	1771	226	1805	805
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	24.5	20.8	34.4	19.7	21.6	30.5	28.3	30.2	34.4	31.3	31.8
Incr Delay (d2), s/veh	5.4	0.9	0.3	407.7	0.3	1.4	14.7	0.9	2.1	272.8	0.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	6.2	1.6	28.9	3.9	5.2	6.7	2.5	3.3	21.2	0.4	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.7	25.5	21.1	442.1	20.0	22.9	45.2	29.2	32.3	307.2	31.5	32.5
LnGrp LOS	D	C	C	F	B	C	D	C	C	F	C	C
Approach Vol, veh/h		990			1775			866			451	
Approach Delay, s/veh		26.3			217.5			36.4			247.4	
Approach LOS		C			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	28.9	20.4	14.8	10.6	32.9	14.6	20.7
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8
Max Green Setting (Gmax), s	10.0	50.0	20.0	* 40	10.0	50.0	10.0	50.0
Max Q Clear Time (g_c+I1), s	12.0	17.3	15.5	4.0	5.9	17.6	12.0	12.5
Green Ext Time (p_c), s	0.0	6.4	0.4	0.4	0.1	5.7	0.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay	136.0
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	13	264	64	22	21	247	629	30	40	440	80
Future Volume (veh/h)	91	13	264	64	22	21	247	629	30	40	440	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	157	22	455	128	44	42	291	740	35	62	677	123
Peak Hour Factor	0.58	0.58	0.58	0.50	0.50	0.50	0.85	0.85	0.85	0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	179	24	495	157	275	262	324	1651	78	103	899	161
Arrive On Green	0.10	0.32	0.32	0.09	0.31	0.31	0.18	0.33	0.33	0.06	0.21	0.21
Sat Flow, veh/h	1781	74	1523	1781	880	840	1781	4997	236	1781	4352	781
Grp Volume(v), veh/h	157	0	477	128	0	86	291	503	272	62	528	272
Grp Sat Flow(s),veh/h/ln	1781	0	1596	1781	0	1719	1781	1702	1828	1781	1702	1730
Q Serve(g_s), s	8.6	0.0	28.6	7.0	0.0	3.6	15.9	11.5	11.6	3.4	14.4	14.7
Cycle Q Clear(g_c), s	8.6	0.0	28.6	7.0	0.0	3.6	15.9	11.5	11.6	3.4	14.4	14.7
Prop In Lane	1.00		0.95	1.00		0.49	1.00		0.13	1.00		0.45
Lane Grp Cap(c), veh/h	179	0	519	157	0	537	324	1125	604	103	703	357
V/C Ratio(X)	0.87	0.00	0.92	0.81	0.00	0.16	0.90	0.45	0.45	0.60	0.75	0.76
Avail Cap(c_a), veh/h	179	0	563	179	0	606	359	1201	645	179	858	436
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.0	0.0	32.2	44.4	0.0	24.7	39.7	26.1	26.1	45.6	37.0	37.1
Incr Delay (d2), s/veh	34.8	0.0	20.1	21.8	0.0	0.2	23.0	0.4	0.7	5.6	3.5	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	13.7	4.0	0.0	1.5	8.6	4.4	4.8	1.6	6.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.8	0.0	52.4	66.2	0.0	24.9	62.8	26.5	26.9	51.2	40.5	44.4
LnGrp LOS	E	A	D	E	A	C	E	C	C	D	D	D
Approach Vol, veh/h		634			214			1066			862	
Approach Delay, s/veh		58.9			49.6			36.5			42.5	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.4	36.9	22.6	26.3	14.6	35.7	10.3	38.6
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	9.0	30.6	17.9	16.7	10.6	5.6	5.4	13.6
Green Ext Time (p_c), s	0.0	1.7	0.2	3.8	0.0	0.7	0.0	6.3

Intersection Summary	
HCM 6th Ctrl Delay	44.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	495	1230	119	744	1521	352	170	234	468	560	194	337
Future Volume (veh/h)	495	1230	119	744	1521	352	170	234	468	560	194	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	589	1464	142	865	1769	409	191	263	526	848	294	511
Peak Hour Factor	0.84	0.84	0.84	0.86	0.86	0.86	0.89	0.89	0.89	0.66	0.66	0.66
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	610	1442	448	610	1442	448	217	1087	594	610	1367	424
Arrive On Green	0.18	0.28	0.28	0.18	0.28	0.28	0.12	0.21	0.21	0.18	0.27	0.27
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	589	1464	142	865	1769	409	191	263	526	848	294	511
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	24.0	40.0	10.0	25.0	40.0	35.4	14.9	6.1	25.9	25.0	6.3	37.9
Cycle Q Clear(g_c), s	24.0	40.0	10.0	25.0	40.0	35.4	14.9	6.1	25.9	25.0	6.3	37.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	610	1442	448	610	1442	448	217	1087	594	610	1367	424
V/C Ratio(X)	0.97	1.02	0.32	1.42	1.23	0.91	0.88	0.24	0.89	1.39	0.22	1.20
Avail Cap(c_a), veh/h	610	1442	448	610	1442	448	314	1262	689	610	1367	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.9	50.8	40.1	58.3	50.8	49.2	61.2	46.3	54.1	58.3	40.3	51.9
Incr Delay (d2), s/veh	28.0	27.6	0.4	197.7	108.4	23.1	17.8	0.1	12.0	185.6	0.1	112.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.6	20.2	3.9	27.4	31.0	16.5	7.7	2.5	9.9	26.3	2.6	27.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.9	78.4	40.5	256.1	159.3	72.3	79.0	46.4	66.1	243.9	40.4	164.2
LnGrp LOS	F	F	D	F	F	E	E	D	E	F	D	F
Approach Vol, veh/h		2195			3043			980			1653	
Approach Delay, s/veh		78.0			175.1			63.3			183.1	
Approach LOS		E			F			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.0	46.0	21.7	43.9	30.0	46.0	29.5	36.2				
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0				
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0				
Max Q Clear Time (g_c+I1), s	27.0	42.0	16.9	39.9	26.0	42.0	27.0	27.9				
Green Ext Time (p_c), s	0.0	0.0	0.3	0.0	0.0	0.0	0.0	2.2				

Intersection Summary	
HCM 6th Ctrl Delay	135.8
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	129	15	10	3	36	84	1	349	1	121	357	140
Future Volume (veh/h)	129	15	10	3	36	84	1	349	1	121	357	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	152	18	12	6	72	168	1	447	1	166	489	192
Peak Hour Factor	0.85	0.85	0.85	0.50	0.50	0.50	0.78	0.78	0.78	0.73	0.73	0.73
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	202	485	411	11	285	242	3	1197	3	218	1782	553
Arrive On Green	0.11	0.26	0.26	0.01	0.15	0.15	0.00	0.23	0.23	0.12	0.35	0.35
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5261	12	1781	5106	1585
Grp Volume(v), veh/h	152	18	12	6	72	168	1	289	159	166	489	192
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1868	1781	1702	1585
Q Serve(g_s), s	4.3	0.4	0.3	0.2	1.8	5.2	0.0	3.7	3.7	4.7	3.6	4.7
Cycle Q Clear(g_c), s	4.3	0.4	0.3	0.2	1.8	5.2	0.0	3.7	3.7	4.7	3.6	4.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	202	485	411	11	285	242	3	774	425	218	1782	553
V/C Ratio(X)	0.75	0.04	0.03	0.53	0.25	0.69	0.29	0.37	0.37	0.76	0.27	0.35
Avail Cap(c_a), veh/h	684	898	761	684	898	761	684	1961	1076	684	2942	913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	14.4	14.4	25.8	19.4	20.9	26.0	17.0	17.0	22.1	12.2	12.6
Incr Delay (d2), s/veh	5.6	0.0	0.0	33.0	0.5	3.6	41.5	1.1	2.0	5.4	0.3	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.2	0.1	0.2	0.8	1.9	0.1	1.3	1.6	2.0	1.1	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	14.4	14.4	58.8	19.9	24.5	67.5	18.1	19.0	27.5	12.5	13.9
LnGrp LOS	C	B	B	E	B	C	E	B	B	C	B	B
Approach Vol, veh/h		182			246			449			847	
Approach Delay, s/veh		25.8			24.0			18.5			15.8	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.8	18.5	4.6	24.2	10.4	12.9	10.9	17.8
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.2	2.4	2.0	6.7	6.3	7.2	6.7	5.7
Green Ext Time (p_c), s	0.0	0.1	0.0	8.9	0.3	0.9	0.3	6.1

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑	↱	↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	63	1458	66	226	1590	212	23	35	216	165	36	27
Future Volume (veh/h)	63	1458	66	226	1590	212	23	35	216	165	36	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	1997	90	240	1691	226	25	38	232	217	47	36
Peak Hour Factor	0.73	0.73	0.73	0.94	0.94	0.94	0.93	0.93	0.93	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	109	1887	85	264	1648	735	40	305	259	242	272	208
Arrive On Green	0.06	0.38	0.38	0.15	0.46	0.46	0.02	0.16	0.16	0.14	0.28	0.28
Sat Flow, veh/h	1781	5009	225	1781	3554	1585	1781	1870	1585	1781	982	752
Grp Volume(v), veh/h	86	1355	732	240	1691	226	25	38	232	217	0	83
Grp Sat Flow(s),veh/h/ln	1781	1702	1830	1781	1777	1585	1781	1870	1585	1781	0	1735
Q Serve(g_s), s	6.3	50.0	50.0	17.6	61.5	11.8	1.8	2.3	19.0	15.9	0.0	4.8
Cycle Q Clear(g_c), s	6.3	50.0	50.0	17.6	61.5	11.8	1.8	2.3	19.0	15.9	0.0	4.8
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	109	1282	689	264	1648	735	40	305	259	242	0	480
V/C Ratio(X)	0.79	1.06	1.06	0.91	1.03	0.31	0.62	0.12	0.90	0.90	0.00	0.17
Avail Cap(c_a), veh/h	268	1282	689	268	1648	735	268	423	358	268	0	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	61.5	41.4	41.4	55.7	35.6	22.3	64.3	47.4	54.4	56.4	0.0	36.5
Incr Delay (d2), s/veh	12.1	41.7	51.7	32.2	29.2	0.3	14.4	0.2	19.1	28.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	27.9	31.9	10.1	31.5	4.5	1.0	1.1	8.9	9.0	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.5	83.1	93.1	87.9	64.8	22.6	78.7	47.6	73.6	84.6	0.0	36.7
LnGrp LOS	E	F	F	F	F	C	E	D	E	F	A	D
Approach Vol, veh/h		2173			2157			295			300	
Approach Delay, s/veh		86.1			62.9			70.7			71.3	
Approach LOS		F			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.9	56.0	8.6	43.2	13.4	67.5	23.6	28.2
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	19.6	52.0	3.8	6.8	8.3	63.5	17.9	21.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4	0.1	0.0	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	74.1
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	20	45	115	35	28	37	64	89	25	40	0
Future Vol, veh/h	0	20	45	115	35	28	37	64	89	25	40	0
Peak Hour Factor	0.61	0.61	0.61	0.54	0.54	0.54	0.75	0.75	0.75	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	33	74	213	65	52	49	85	119	30	48	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	12	10.5	9.3
HCM LOS	A	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	0%	65%	38%
Vol Thru, %	34%	31%	20%	62%
Vol Right, %	47%	69%	16%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	190	65	178	65
LT Vol	37	0	115	25
Through Vol	64	20	35	40
RT Vol	89	45	28	0
Lane Flow Rate	253	107	330	78
Geometry Grp	1	1	1	1
Degree of Util (X)	0.342	0.144	0.45	0.12
Departure Headway (Hd)	4.857	4.87	4.914	5.521
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	732	741	725	652
Service Time	2.947	2.874	3.001	3.527
HCM Lane V/C Ratio	0.346	0.144	0.455	0.12
HCM Control Delay	10.5	8.7	12	9.3
HCM Lane LOS	B	A	B	A
HCM 95th-tile Q	1.5	0.5	2.3	0.4

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	0	34	0	11	27	26	0	0	6	27	0	3
Future Vol, veh/h	0	34	0	11	27	26	0	0	6	27	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	71	71	71	100	100	100	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	68	0	15	38	37	0	0	6	31	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	75	0	0	68	0	0	156	173	68	158	155	57
Stage 1	-	-	-	-	-	-	68	68	-	87	87	-
Stage 2	-	-	-	-	-	-	88	105	-	71	68	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1524	-	-	1533	-	-	810	720	995	808	737	1009
Stage 1	-	-	-	-	-	-	942	838	-	921	823	-
Stage 2	-	-	-	-	-	-	920	808	-	939	838	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1524	-	-	1533	-	-	801	713	995	797	730	1009
Mov Cap-2 Maneuver	-	-	-	-	-	-	801	713	-	797	730	-
Stage 1	-	-	-	-	-	-	942	838	-	921	815	-
Stage 2	-	-	-	-	-	-	908	800	-	933	838	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.3	8.6	9.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	995	1524	-	-	1533	-	-	814
HCM Lane V/C Ratio	0.006	-	-	-	0.01	-	-	0.042
HCM Control Delay (s)	8.6	0	-	-	7.4	0	-	9.6
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	9	12	158	198	5
Future Vol, veh/h	9	9	12	158	198	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	57	57	75	75	53	53
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	16	16	211	374	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	622	379	383	0	-	0
Stage 1	379	-	-	-	-	-
Stage 2	243	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	450	668	1175	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	797	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	443	668	1175	-	-	-
Mov Cap-2 Maneuver	443	-	-	-	-	-
Stage 1	682	-	-	-	-	-
Stage 2	797	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1175	-	533	-	-
HCM Lane V/C Ratio	0.014	-	0.059	-	-
HCM Control Delay (s)	8.1	0	12.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	14	32	10	24	54
Future Vol, veh/h	16	14	32	10	24	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	14	32	10	24	54

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	139	37	0	0	42	0
Stage 1	37	-	-	-	-	-
Stage 2	102	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	854	1035	-	-	1567	-
Stage 1	985	-	-	-	-	-
Stage 2	922	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	840	1035	-	-	1567	-
Mov Cap-2 Maneuver	840	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	907	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	2.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	921	1567	-
HCM Lane V/C Ratio	-	-	0.033	0.015	-
HCM Control Delay (s)	-	-	9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	1692.6					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	81	1365	1262	378	222	48
Future Vol, veh/h	81	1365	1262	378	222	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	81	1365	1262	378	222	48

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1640	0	-	0	2296	820
Stage 1	-	-	-	-	1451	-
Stage 2	-	-	-	-	845	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	391	-	-	-	~ 33	318
Stage 1	-	-	-	-	~ 182	-
Stage 2	-	-	-	-	382	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	391	-	-	-	~ 5	318
Mov Cap-2 Maneuver	-	-	-	-	~ 5	-
Stage 1	-	-	-	-	~ 26	-
Stage 2	-	-	-	-	382	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	$ 21000.7
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	391	-	-	-	6
HCM Lane V/C Ratio	0.207	-	-	-	45
HCM Control Delay (s)	16.6	6.4	-	$ 21000.7	
HCM Lane LOS	C	A	-	-	F
HCM 95th %tile Q(veh)	0.8	-	-	-	35.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary
11: I-5 NB Off Ramp/I-5 NB On Ramp & W Lathrop Rd

Baseline + Proj PM Peak
Timing Plan: BL+P PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	283	1064	0	0	1065	275	365	5	424	0	0	0
Future Volume (veh/h)	283	1064	0	0	1065	275	365	5	424	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	368	1382	0	0	1197	309	435	6	505			
Peak Hour Factor	0.77	0.77	0.77	0.89	0.89	0.89	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	345	2032	0	0	951	242	261	4	303			
Arrive On Green	0.19	0.57	0.00	0.00	0.34	0.34	0.34	0.34	0.34			
Sat Flow, veh/h	1781	3647	0	0	2898	714	769	11	892			
Grp Volume(v), veh/h	368	1382	0	0	753	753	946	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1742	1671	0	0			
Q Serve(g_s), s	20.0	28.1	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	20.0	28.1	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.41	0.46		0.53			
Lane Grp Cap(c), veh/h	345	2032	0	0	603	591	567	0	0			
V/C Ratio(X)	1.07	0.68	0.00	0.00	1.25	1.28	1.67	0.00	0.00			
Avail Cap(c_a), veh/h	345	2032	0	0	603	591	567	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	41.6	15.5	0.0	0.0	34.1	34.1	34.1	0.0	0.0			
Incr Delay (d2), s/veh	67.0	1.2	0.0	0.0	125.4	136.7	308.7	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	15.0	10.7	0.0	0.0	35.4	36.6	61.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	108.6	16.7	0.0	0.0	159.5	170.8	342.8	0.0	0.0			
LnGrp LOS	F	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1750			1506			946				
Approach Delay, s/veh		36.0			165.2			342.8				
Approach LOS		D			F			F				

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		63.6			24.0	39.6		39.6
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0
Max Q Clear Time (g_c+I1), s		30.1			22.0	37.0		37.0
Green Ext Time (p_c), s		19.4			0.0	0.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		151.4
HCM 6th LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	994	409	287	1143	0	0	0	0	353	8	321
Future Volume (veh/h)	0	994	409	287	1143	0	0	0	0	353	8	321
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1362	560	322	1284	0				406	9	369
Peak Hour Factor	0.73	0.73	0.73	0.89	0.89	0.89				0.87	0.87	0.87
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1210	491	345	1069	0				296	7	269
Arrive On Green	0.00	0.34	0.34	0.19	0.57	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	3735	1447	1781	1870	0				872	19	793
Grp Volume(v), veh/h	0	1299	623	322	1284	0				784	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1610	1781	1870	0				1684	0	0
Q Serve(g_s), s	0.0	35.0	35.0	18.4	59.0	0.0				35.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	35.0	35.0	18.4	59.0	0.0				35.0	0.0	0.0
Prop In Lane	0.00		0.90	1.00		0.00				0.52		0.47
Lane Grp Cap(c), veh/h	0	1154	546	345	1069	0				571	0	0
V/C Ratio(X)	0.00	1.13	1.14	0.93	1.20	0.00				1.37	0.00	0.00
Avail Cap(c_a), veh/h	0	1154	546	345	1069	0				571	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	34.1	34.1	40.9	22.1	0.0				34.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	67.9	83.7	31.6	99.5	0.0				178.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	24.7	25.8	10.9	52.4	0.0				41.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	102.0	117.8	72.6	121.6	0.0				212.7	0.0	0.0
LnGrp LOS	A	F	F	E	F	A				F	A	A
Approach Vol, veh/h		1922			1606						784	
Approach Delay, s/veh		107.2			111.8						212.7	
Approach LOS		F			F						F	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	24.0	39.6		39.6		63.6						
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6						
Max Green Setting (Gmax), s	20.0	35.0		35.0		59.0						
Max Q Clear Time (g_c+I1), s	20.4	37.0		37.0		61.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0						

Intersection Summary			
HCM 6th Ctrl Delay			128.1
HCM 6th LOS			F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	525	1220	0	0	1187	567	1236	6	469	0	0	0
Future Volume (veh/h)	525	1220	0	0	1187	567	1236	6	469	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	565	1312	0	0	1236	0	1288	6	489			
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	375	2025	0	0	1121		578	3	517			
Arrive On Green	0.21	0.57	0.00	0.00	0.32	0.00	0.33	0.33	0.33			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1773	8	1585			
Grp Volume(v), veh/h	565	1312	0	0	1236	0	1294	0	489			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	20.0	23.9	0.0	0.0	30.0	0.0	31.0	0.0	28.6			
Cycle Q Clear(g_c), s	20.0	23.9	0.0	0.0	30.0	0.0	31.0	0.0	28.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	375	2025	0	0	1121		581	0	517			
V/C Ratio(X)	1.51	0.65	0.00	0.00	1.10		2.23	0.00	0.95			
Avail Cap(c_a), veh/h	375	2025	0	0	1121		581	0	517			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	37.5	13.9	0.0	0.0	32.5	0.0	32.1	0.0	31.2			
Incr Delay (d2), s/veh	242.2	0.8	0.0	0.0	59.5	0.0	558.2	0.0	26.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	33.4	8.3	0.0	0.0	21.1	0.0	102.3	0.0	13.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	279.7	14.8	0.0	0.0	92.1	0.0	590.2	0.0	58.0			
LnGrp LOS	F	B	A	A	F		F	A	E			
Approach Vol, veh/h		1877			1236			1783				
Approach Delay, s/veh		94.5			92.1			444.3				
Approach LOS		F			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		59.5			24.2	35.3		35.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		25.9			22.0	32.0		33.0				
Green Ext Time (p_c), s		14.6			0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		221.3
HCM 6th LOS		F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1382	982	300	2123	0	0	0	0	363	1	652
Future Volume (veh/h)	0	1382	982	300	2123	0	0	0	0	363	1	652
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1502	1067	316	2235	0				491	1	881
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95				0.74	0.74	0.74
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1244	386	282	847	0				759	1	675
Arrive On Green	0.00	0.24	0.24	0.16	0.45	0.00				0.43	0.43	0.43
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	2	1584
Grp Volume(v), veh/h	0	1502	1067	316	2235	0				491	0	882
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1585
Q Serve(g_s), s	0.0	20.0	20.0	13.0	37.2	0.0				17.9	0.0	35.0
Cycle Q Clear(g_c), s	0.0	20.0	20.0	13.0	37.2	0.0				17.9	0.0	35.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1244	386	282	847	0				759	0	676
V/C Ratio(X)	0.00	1.21	2.76	1.12	2.64	0.00				0.65	0.00	1.31
Avail Cap(c_a), veh/h	0	1244	386	282	847	0				759	0	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.1	31.0	34.5	22.4	0.0				18.7	0.0	23.6
Incr Delay (d2), s/veh	0.0	101.2	800.7	89.9	740.2	0.0				2.0	0.0	147.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	19.1	92.9	12.3	188.0	0.0				6.9	0.0	38.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	132.2	831.8	124.5	762.6	0.0				20.7	0.0	171.4
LnGrp LOS	A	F	F	F	F	A				C	A	F
Approach Vol, veh/h		2569			2551						1373	
Approach Delay, s/veh		422.8			683.6						117.5	
Approach LOS		F			F						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.2	25.3		39.6		42.5						
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3						
Max Green Setting (Gmax), s	* 13	20.0		35.0		37.2						
Max Q Clear Time (g_c+I1), s	15.0	22.0		37.0		39.2						
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0						

Intersection Summary		
HCM 6th Ctrl Delay		460.7
HCM 6th LOS		F

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	624	65	477	403	376	265	47	297	128	29	21
Future Volume (veh/h)	51	624	65	477	403	376	265	47	297	128	29	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	975	102	530	448	409	353	51	396	139	32	23
Peak Hour Factor	0.92	0.64	0.64	0.90	0.90	0.92	0.75	0.92	0.75	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	1219	544	625	1664	742	334	327	487	173	300	134
Arrive On Green	0.06	0.34	0.34	0.18	0.47	0.47	0.19	0.17	0.17	0.10	0.08	0.08
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	55	975	102	530	448	409	353	51	396	139	32	23
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	3.0	24.4	4.4	14.6	7.5	18.2	18.4	2.3	13.4	7.5	0.8	1.3
Cycle Q Clear(g_c), s	3.0	24.4	4.4	14.6	7.5	18.2	18.4	2.3	13.4	7.5	0.8	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	1219	544	625	1664	742	334	327	487	173	300	134
V/C Ratio(X)	0.56	0.80	0.19	0.85	0.27	0.55	1.06	0.16	0.81	0.80	0.11	0.17
Avail Cap(c_a), veh/h	276	1704	760	823	2001	892	334	743	1108	370	1527	681
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	29.2	22.7	38.9	15.9	18.7	39.9	34.4	39.0	43.4	41.6	41.8
Incr Delay (d2), s/veh	4.9	1.9	0.2	6.5	0.1	0.6	65.4	0.2	3.3	8.4	0.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	10.3	1.6	6.6	2.9	6.0	13.6	1.0	4.5	3.7	0.4	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.1	31.1	22.8	45.4	16.0	19.4	105.3	34.6	42.3	51.9	41.7	42.4
LnGrp LOS	D	C	C	D	B	B	F	C	D	D	D	D
Approach Vol, veh/h		1132			1387			800			194	
Approach Delay, s/veh		31.3			28.2			69.6			49.1	
Approach LOS		C			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.4	38.8	23.0	14.1	10.0	51.1	14.1	23.0				
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8				
Max Green Setting (Gmax), s	23.4	47.1	18.4	* 42	15.2	55.3	20.4	39.0				
Max Q Clear Time (g_c+I1), s	16.6	26.4	20.4	3.3	5.0	20.2	9.5	15.4				
Green Ext Time (p_c), s	1.2	7.3	0.0	0.2	0.1	4.8	0.2	1.7				
Intersection Summary												
HCM 6th Ctrl Delay			39.8									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	326	1410	74	495	674	161	84	199	479	531	144	180
Future Volume (veh/h)	326	1410	74	495	674	161	84	199	479	531	144	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	384	1659	87	589	802	192	101	240	577	805	218	273
Peak Hour Factor	0.85	0.85	0.85	0.84	0.84	0.84	0.83	0.83	0.83	0.66	0.66	0.66
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	442	1618	502	595	1845	573	124	956	1003	607	1497	667
Arrive On Green	0.13	0.32	0.32	0.17	0.36	0.36	0.07	0.19	0.19	0.18	0.29	0.29
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	384	1659	87	589	802	192	101	240	577	805	218	273
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	15.8	46.0	5.8	24.7	17.3	12.8	8.1	5.8	24.3	25.5	4.6	17.5
Cycle Q Clear(g_c), s	15.8	46.0	5.8	24.7	17.3	12.8	8.1	5.8	24.3	25.5	4.6	17.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	442	1618	502	595	1845	573	124	956	1003	607	1497	667
V/C Ratio(X)	0.87	1.03	0.17	0.99	0.43	0.34	0.81	0.25	0.58	1.33	0.15	0.41
Avail Cap(c_a), veh/h	571	1618	502	595	1845	573	313	1002	1028	607	1497	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.1	49.6	35.8	60.0	35.1	33.7	66.6	50.3	37.6	59.8	37.9	29.4
Incr Delay (d2), s/veh	11.1	29.1	0.2	34.2	0.2	0.3	11.9	0.1	0.8	158.0	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	23.3	2.2	13.4	7.1	4.9	4.0	2.5	8.2	24.2	1.9	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.2	78.7	36.0	94.2	35.3	34.0	78.5	50.5	38.3	217.9	37.9	29.8
LnGrp LOS	E	F	D	F	D	C	E	D	D	F	D	C
Approach Vol, veh/h		2130			1583			918			1296	
Approach Delay, s/veh		76.0			57.0			45.9			148.0	
Approach LOS		E			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	52.0	14.6	48.6	23.6	58.4	30.0	33.2
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	46.0	25.5	28.5	24.0	47.0	25.5	28.5
Max Q Clear Time (g_c+I1), s	26.7	48.0	10.1	19.5	17.8	19.3	27.5	26.3
Green Ext Time (p_c), s	0.0	0.0	0.2	1.5	0.7	6.2	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	82.0
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	1359	48	130	714	92	44	141	239	198	137	67
Future Volume (veh/h)	47	1359	48	130	714	92	44	141	239	198	137	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	1544	55	157	860	111	56	181	306	360	249	122
Peak Hour Factor	0.88	0.88	0.88	0.83	0.83	0.83	0.78	0.78	0.78	0.55	0.55	0.55
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	1743	62	184	1452	648	73	351	461	332	395	193
Arrive On Green	0.04	0.34	0.34	0.10	0.41	0.41	0.04	0.19	0.19	0.19	0.33	0.33
Sat Flow, veh/h	1781	5062	180	1781	3554	1585	1781	1870	1585	1781	1185	581
Grp Volume(v), veh/h	53	1038	561	157	860	111	56	181	306	360	0	371
Grp Sat Flow(s),veh/h/ln	1781	1702	1838	1781	1777	1585	1781	1870	1585	1781	0	1766
Q Serve(g_s), s	3.9	37.7	37.7	11.4	24.7	5.8	4.1	11.4	22.2	24.4	0.0	23.2
Cycle Q Clear(g_c), s	3.9	37.7	37.7	11.4	24.7	5.8	4.1	11.4	22.2	24.4	0.0	23.2
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	69	1172	633	184	1452	648	73	351	461	332	0	588
V/C Ratio(X)	0.77	0.89	0.89	0.85	0.59	0.17	0.77	0.52	0.66	1.08	0.00	0.63
Avail Cap(c_a), veh/h	272	1300	702	272	1452	648	272	366	473	332	0	588
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.4	40.5	40.5	57.8	30.2	24.6	62.2	47.8	40.8	53.3	0.0	36.9
Incr Delay (d2), s/veh	16.2	6.6	11.4	15.7	0.8	0.2	15.5	1.2	3.4	73.9	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	16.6	18.7	5.8	10.3	2.2	2.2	5.4	9.0	17.6	0.0	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.6	47.1	51.9	73.4	31.0	24.8	77.7	49.0	44.2	127.1	0.0	39.0
LnGrp LOS	E	D	D	E	C	C	E	D	D	F	A	D
Approach Vol, veh/h		1652			1128			543			731	
Approach Delay, s/veh		49.8			36.3			49.3			82.4	
Approach LOS		D			D			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.8	51.1	10.9	50.1	10.4	59.5	30.0	31.1
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	24.4	25.6
Max Q Clear Time (g_c+I1), s	13.4	39.7	6.1	25.2	5.9	26.7	26.4	24.2
Green Ext Time (p_c), s	0.2	5.4	0.1	0.9	0.1	8.7	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	51.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	23	1154	719	106	300	64
Future Volume (veh/h)	23	1154	719	106	300	64
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	23	1154	719	106	300	64
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	49	1857	1199	177	462	411
Arrive On Green	0.03	0.52	0.39	0.39	0.26	0.26
Sat Flow, veh/h	1781	3647	3201	458	1781	1585
Grp Volume(v), veh/h	23	1154	411	414	300	64
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1788	1781	1585
Q Serve(g_s), s	0.6	10.5	8.5	8.5	6.9	1.4
Cycle Q Clear(g_c), s	0.6	10.5	8.5	8.5	6.9	1.4
Prop In Lane	1.00			0.26	1.00	1.00
Lane Grp Cap(c), veh/h	49	1857	686	690	462	411
V/C Ratio(X)	0.47	0.62	0.60	0.60	0.65	0.16
Avail Cap(c_a), veh/h	583	6977	2713	2730	1360	1210
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.0	7.7	11.2	11.3	15.1	13.1
Incr Delay (d2), s/veh	6.7	0.3	0.8	0.8	1.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	2.6	2.7	2.7	2.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.7	8.1	12.1	12.1	16.7	13.3
LnGrp LOS	C	A	B	B	B	B
Approach Vol, veh/h		1177	825		364	
Approach Delay, s/veh		8.5	12.1		16.1	
Approach LOS		A	B		B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		29.0		16.9	6.3	22.7
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		90.0		35.0	15.0	70.0
Max Q Clear Time (g_c+I1), s		12.5		8.9	2.6	10.5
Green Ext Time (p_c), s		11.4		1.1	0.0	6.0

Intersection Summary		
HCM 6th Ctrl Delay		10.9
HCM 6th LOS		B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	275	881	0	0	1003	296	370	0	308	0	0	0
Future Volume (veh/h)	275	881	0	0	1003	296	370	0	308	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	348	1115	0	0	1140	336	440	0	367			
Peak Hour Factor	0.79	0.79	0.79	0.88	0.88	0.88	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	311	2032	0	0	974	283	312	0	260			
Arrive On Green	0.17	0.57	0.00	0.00	0.36	0.36	0.34	0.00	0.34			
Sat Flow, veh/h	1781	3647	0	0	2809	790	919	0	767			
Grp Volume(v), veh/h	348	1115	0	0	741	735	807	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1728	1686	0	0			
Q Serve(g_s), s	18.0	20.2	0.0	0.0	37.0	37.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	18.0	20.2	0.0	0.0	37.0	37.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.46	0.55		0.45			
Lane Grp Cap(c), veh/h	311	2032	0	0	637	620	572	0	0			
V/C Ratio(X)	1.12	0.55	0.00	0.00	1.16	1.19	1.41	0.00	0.00			
Avail Cap(c_a), veh/h	311	2032	0	0	637	620	572	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	42.6	13.8	0.0	0.0	33.1	33.1	34.1	0.0	0.0			
Incr Delay (d2), s/veh	87.4	0.5	0.0	0.0	89.7	99.6	195.2	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	15.3	7.6	0.0	0.0	31.0	31.9	44.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	130.0	14.3	0.0	0.0	122.8	132.7	229.3	0.0	0.0			
LnGrp LOS	F	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1463			1476			807				
Approach Delay, s/veh		41.8			127.7			229.3				
Approach LOS		D			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		63.6			22.0	41.6		39.6				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		59.0			18.0	37.0		35.0				
Max Q Clear Time (g_c+I1), s		22.2			20.0	39.0		37.0				
Green Ext Time (p_c), s		17.7			0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			116.1									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	876	339	312	1061	0	0	0	0	280	4	213
Future Volume (veh/h)	0	876	339	312	1061	0	0	0	0	280	4	213
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1288	499	359	1220	0				311	4	237
Peak Hour Factor	0.68	0.68	0.68	0.87	0.87	0.87				0.90	0.90	0.90
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1371	528	345	1142	0				286	4	218
Arrive On Green	0.00	0.38	0.38	0.19	0.61	0.00				0.30	0.30	0.30
Sat Flow, veh/h	0	3795	1396	1781	1870	0				953	12	726
Grp Volume(v), veh/h	0	1208	579	359	1220	0				552	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1619	1781	1870	0				1692	0	0
Q Serve(g_s), s	0.0	35.3	35.7	20.0	63.0	0.0				31.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	35.3	35.7	20.0	63.0	0.0				31.0	0.0	0.0
Prop In Lane	0.00		0.86	1.00		0.00				0.56		0.43
Lane Grp Cap(c), veh/h	0	1286	612	345	1142	0				508	0	0
V/C Ratio(X)	0.00	0.94	0.95	1.04	1.07	0.00				1.09	0.00	0.00
Avail Cap(c_a), veh/h	0	1286	612	345	1142	0				508	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	31.0	31.1	41.6	20.1	0.0				36.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	13.5	24.2	59.2	47.0	0.0				65.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.2	17.3	14.2	38.5	0.0				21.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	44.4	55.2	100.8	67.1	0.0				101.4	0.0	0.0
LnGrp LOS	A	D	E	F	F	A				F	A	A
Approach Vol, veh/h		1787			1579						552	
Approach Delay, s/veh		47.9			74.7						101.4	
Approach LOS		D			E						F	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	24.0	43.6		35.6		67.6						
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6						
Max Green Setting (Gmax), s	20.0	39.0		31.0		63.0						
Max Q Clear Time (g_c+I1), s	22.0	37.7		33.0		65.0						
Green Ext Time (p_c), s	0.0	1.2		0.0		0.0						

Intersection Summary		
HCM 6th Ctrl Delay		66.3
HCM 6th LOS		E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	651	1058	0	0	811	323	679	4	408	0	0	0
Future Volume (veh/h)	651	1058	0	0	811	323	679	4	408	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	693	1126	0	0	863	0	808	5	486			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	487	2025	0	0	897		577	4	517			
Arrive On Green	0.27	0.57	0.00	0.00	0.25	0.00	0.33	0.33	0.33			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1771	11	1585			
Grp Volume(v), veh/h	693	1126	0	0	863	0	813	0	486			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	26.0	19.0	0.0	0.0	22.8	0.0	31.0	0.0	28.3			
Cycle Q Clear(g_c), s	26.0	19.0	0.0	0.0	22.8	0.0	31.0	0.0	28.3			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	487	2025	0	0	897		581	0	517			
V/C Ratio(X)	1.42	0.56	0.00	0.00	0.96		1.40	0.00	0.94			
Avail Cap(c_a), veh/h	487	2025	0	0	897		581	0	517			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	34.5	12.9	0.0	0.0	35.1	0.0	32.1	0.0	31.2			
Incr Delay (d2), s/veh	202.1	0.4	0.0	0.0	21.4	0.0	190.1	0.0	25.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	37.8	6.5	0.0	0.0	11.9	0.0	43.0	0.0	13.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	236.6	13.3	0.0	0.0	56.5	0.0	222.2	0.0	56.7			
LnGrp LOS	F	B	A	A	E		F	A	E			
Approach Vol, veh/h		1819			863			1299				
Approach Delay, s/veh		98.4			56.5			160.3				
Approach LOS		F			E			F				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		59.5			30.2	29.3		35.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 26	24.0		31.0				
Max Q Clear Time (g_c+I1), s		21.0			28.0	24.8		33.0				
Green Ext Time (p_c), s		12.9			0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	109.5
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1318	1123	279	1211	0	0	0	0	392	6	450
Future Volume (veh/h)	0	1318	1123	279	1211	0	0	0	0	392	6	450
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1417	1208	307	1331	0				467	7	536
Peak Hour Factor	0.93	0.93	0.93	0.91	0.91	0.91				0.84	0.84	0.84
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	2168	673	247	1106	0				610	7	537
Arrive On Green	0.00	0.42	0.42	0.14	0.59	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	20	1568
Grp Volume(v), veh/h	0	1417	1208	307	1331	0				467	0	543
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1588
Q Serve(g_s), s	0.0	33.1	63.7	20.8	88.7	0.0				35.0	0.0	51.2
Cycle Q Clear(g_c), s	0.0	33.1	63.7	20.8	88.7	0.0				35.0	0.0	51.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.99
Lane Grp Cap(c), veh/h	0	2168	673	247	1106	0				610	0	544
V/C Ratio(X)	0.00	0.65	1.79	1.24	1.20	0.00				0.77	0.00	1.00
Avail Cap(c_a), veh/h	0	2168	673	247	1106	0				610	0	544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	34.4	43.2	64.6	30.7	0.0				43.9	0.0	49.2
Incr Delay (d2), s/veh	0.0	0.7	363.5	138.7	100.3	0.0				5.9	0.0	38.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.5	91.8	18.8	67.4	0.0				16.1	0.0	25.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	35.1	406.7	203.3	131.0	0.0				49.9	0.0	87.2
LnGrp LOS	A	D	F	F	F	A				D	A	F
Approach Vol, veh/h		2625			1638						1010	
Approach Delay, s/veh		206.1			144.5						69.9	
Approach LOS		F			F						E	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	25.0	69.0		56.0		94.0
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3
Max Green Setting (Gmax), s	* 21	63.7		51.4		88.7
Max Q Clear Time (g_c+I1), s	22.8	65.7		53.2		90.7
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		160.9
HCM 6th LOS		F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	442	71	662	461	341	264	146	330	325	49	41
Future Volume (veh/h)	83	442	71	662	461	341	264	146	330	325	49	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	90	775	125	828	576	371	314	159	393	353	53	45
Peak Hour Factor	0.92	0.57	0.57	0.80	0.80	0.92	0.84	0.92	0.84	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	964	430	704	1459	651	285	323	482	316	675	301
Arrive On Green	0.06	0.27	0.27	0.20	0.41	0.41	0.16	0.17	0.17	0.18	0.19	0.19
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	90	775	125	828	576	371	314	159	393	353	53	45
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	5.7	23.4	7.2	23.4	13.1	20.7	18.4	8.8	15.6	20.4	1.4	2.7
Cycle Q Clear(g_c), s	5.7	23.4	7.2	23.4	13.1	20.7	18.4	8.8	15.6	20.4	1.4	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	114	964	430	704	1459	651	285	323	482	316	675	301
V/C Ratio(X)	0.79	0.80	0.29	1.18	0.39	0.57	1.10	0.49	0.82	1.12	0.08	0.15
Avail Cap(c_a), veh/h	236	1457	650	704	1710	763	285	635	947	316	1305	582
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	39.0	33.1	45.7	23.8	26.1	48.2	43.0	45.8	47.2	38.3	38.8
Incr Delay (d2), s/veh	11.2	2.0	0.4	93.9	0.2	0.8	83.0	1.2	3.4	85.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	10.3	2.7	19.0	5.4	7.4	14.4	4.0	5.4	16.2	0.6	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.2	41.0	33.5	139.6	24.0	26.8	131.2	44.1	49.2	132.9	38.3	39.0
LnGrp LOS	E	D	C	F	C	C	F	D	D	F	D	D
Approach Vol, veh/h		990			1775			866			451	
Approach Delay, s/veh		42.2			78.5			78.0			112.4	
Approach LOS		D			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.0	36.3	23.0	27.6	12.0	52.3	25.0	25.6
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8
Max Green Setting (Gmax), s	23.4	47.1	18.4	* 42	15.2	55.3	20.4	39.0
Max Q Clear Time (g_c+I1), s	25.4	25.4	20.4	4.7	7.7	22.7	22.4	17.6
Green Ext Time (p_c), s	0.0	5.8	0.0	0.4	0.1	5.7	0.0	2.3

Intersection Summary	
HCM 6th Ctrl Delay	73.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	495	1230	119	744	1521	352	170	234	468	560	194	337
Future Volume (veh/h)	495	1230	119	744	1521	352	170	234	468	560	194	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	589	1464	142	865	1769	409	191	263	526	848	294	511
Peak Hour Factor	0.84	0.84	0.84	0.86	0.86	0.86	0.89	0.89	0.89	0.66	0.66	0.66
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	554	1553	482	602	1660	515	215	458	737	914	1246	641
Arrive On Green	0.16	0.30	0.30	0.17	0.33	0.33	0.12	0.09	0.09	0.26	0.24	0.24
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	589	1464	142	865	1769	409	191	263	526	848	294	511
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	23.0	40.1	7.1	25.0	46.6	16.3	15.1	7.1	0.0	34.3	6.6	35.0
Cycle Q Clear(g_c), s	23.0	40.1	7.1	25.0	46.6	16.3	15.1	7.1	0.0	34.3	6.6	35.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	554	1553	482	602	1660	515	215	458	737	914	1246	641
V/C Ratio(X)	1.06	0.94	0.29	1.44	1.07	0.79	0.89	0.57	0.71	0.93	0.24	0.80
Avail Cap(c_a), veh/h	554	1566	486	602	1660	515	261	1157	1118	914	1246	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.2	48.7	19.8	59.2	48.4	10.3	62.1	62.6	47.9	51.4	43.5	37.5
Incr Delay (d2), s/veh	56.0	11.8	0.3	205.6	42.0	8.4	25.6	1.1	1.3	15.3	0.1	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	18.2	3.7	27.9	25.6	6.4	8.3	3.1	8.5	16.3	2.7	16.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	116.3	60.4	20.2	264.9	90.4	18.7	87.7	63.8	49.2	66.7	43.6	44.5
LnGrp LOS	F	E	C	F	F	B	F	E	D	E	D	D
Approach Vol, veh/h		2195			3043			980			1653	
Approach Delay, s/veh		72.8			130.4			60.6			55.7	
Approach LOS		E			F			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.0	49.6	21.8	41.0	28.0	52.6	43.9	18.9
Change Period (Y+Rc), s	6.0	* 6	4.5	6.0	5.0	6.0	6.0	* 6
Max Green Setting (Gmax), s	25.0	* 44	21.0	35.0	23.0	46.0	23.5	* 33
Max Q Clear Time (g_c+I1), s	27.0	42.1	17.1	37.0	25.0	48.6	36.3	9.1
Green Ext Time (p_c), s	0.0	1.5	0.2	0.0	0.0	0.0	0.0	3.8

Intersection Summary	
HCM 6th Ctrl Delay	90.0
HCM 6th LOS	F

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	1458	66	226	1590	212	23	35	216	165	36	27
Future Volume (veh/h)	63	1458	66	226	1590	212	23	35	216	165	36	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	1997	90	240	1691	226	25	38	232	217	47	36
Peak Hour Factor	0.73	0.73	0.73	0.94	0.94	0.94	0.93	0.93	0.93	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	2093	94	246	1762	786	40	267	445	229	244	187
Arrive On Green	0.06	0.42	0.42	0.14	0.50	0.50	0.02	0.14	0.14	0.13	0.25	0.25
Sat Flow, veh/h	1781	5009	225	1781	3554	1585	1781	1870	1585	1781	982	752
Grp Volume(v), veh/h	86	1355	732	240	1691	226	25	38	232	217	0	83
Grp Sat Flow(s),veh/h/ln	1781	1702	1830	1781	1777	1585	1781	1870	1585	1781	0	1735
Q Serve(g_s), s	6.5	52.1	52.5	18.2	62.0	11.3	1.9	2.4	16.7	16.4	0.0	5.1
Cycle Q Clear(g_c), s	6.5	52.1	52.5	18.2	62.0	11.3	1.9	2.4	16.7	16.4	0.0	5.1
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	107	1422	765	246	1762	786	40	267	445	229	0	431
V/C Ratio(X)	0.80	0.95	0.96	0.98	0.96	0.29	0.62	0.14	0.52	0.95	0.00	0.19
Avail Cap(c_a), veh/h	154	1434	771	246	1762	786	229	372	534	229	0	431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.8	38.1	38.2	58.1	32.8	20.1	65.6	50.8	41.0	58.5	0.0	40.1
Incr Delay (d2), s/veh	17.3	13.9	22.1	50.2	13.3	0.3	14.8	0.2	0.9	44.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	23.9	27.6	11.4	28.1	4.2	1.0	1.1	6.6	10.2	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.1	52.0	60.3	108.3	46.1	20.4	80.3	51.0	42.0	103.4	0.0	40.3
LnGrp LOS	F	D	E	F	D	C	F	D	D	F	A	D
Approach Vol, veh/h		2173			2157			295			300	
Approach Delay, s/veh		55.9			50.3			46.4			85.9	
Approach LOS		E			D			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	62.5	8.6	40.1	13.5	73.1	23.0	25.8
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	18.7	57.0	17.4	26.9	11.7	64.0	17.4	26.9
Max Q Clear Time (g_c+I1), s	20.2	54.5	3.9	7.1	8.5	64.0	18.4	18.7
Green Ext Time (p_c), s	0.0	2.1	0.0	0.3	0.0	0.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	54.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	81	1365	1262	378	222	48
Future Volume (veh/h)	81	1365	1262	378	222	48
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	81	1365	1262	378	222	48
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	106	2583	1648	482	274	244
Arrive On Green	0.06	0.73	0.61	0.61	0.15	0.15
Sat Flow, veh/h	1781	3647	2805	793	1781	1585
Grp Volume(v), veh/h	81	1365	817	823	222	48
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1728	1781	1585
Q Serve(g_s), s	3.7	14.3	27.9	29.9	10.1	2.2
Cycle Q Clear(g_c), s	3.7	14.3	27.9	29.9	10.1	2.2
Prop In Lane	1.00			0.46	1.00	1.00
Lane Grp Cap(c), veh/h	106	2583	1080	1050	274	244
V/C Ratio(X)	0.77	0.53	0.76	0.78	0.81	0.20
Avail Cap(c_a), veh/h	319	4248	1699	1652	745	663
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.8	5.1	11.9	12.3	34.2	30.9
Incr Delay (d2), s/veh	11.0	0.2	1.1	1.3	5.7	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	3.6	9.4	9.9	4.8	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	49.8	5.2	13.0	13.6	39.9	31.3
LnGrp LOS	D	A	B	B	D	C
Approach Vol, veh/h		1446	1640		270	
Approach Delay, s/veh		7.7	13.3		38.4	
Approach LOS		A	B		D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.8		17.9	10.0	55.8
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		100.0		35.0	15.0	80.0
Max Q Clear Time (g_c+I1), s		16.3		12.1	5.7	31.9
Green Ext Time (p_c), s		15.5		0.8	0.1	19.0
Intersection Summary						
HCM 6th Ctrl Delay			12.9			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	283	1064	0	0	1065	275	365	5	424	0	0	0
Future Volume (veh/h)	283	1064	0	0	1065	275	365	5	424	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	368	1382	0	0	1197	309	435	6	505			
Peak Hour Factor	0.77	0.77	0.77	0.89	0.89	0.89	0.84	0.84	0.84			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	311	2032	0	0	1005	256	261	4	303			
Arrive On Green	0.17	0.57	0.00	0.00	0.36	0.36	0.34	0.34	0.34			
Sat Flow, veh/h	1781	3647	0	0	2898	714	769	11	892			
Grp Volume(v), veh/h	368	1382	0	0	753	753	946	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1742	1671	0	0			
Q Serve(g_s), s	18.0	28.1	0.0	0.0	37.0	37.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	18.0	28.1	0.0	0.0	37.0	37.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.41	0.46		0.53			
Lane Grp Cap(c), veh/h	311	2032	0	0	637	624	567	0	0			
V/C Ratio(X)	1.18	0.68	0.00	0.00	1.18	1.21	1.67	0.00	0.00			
Avail Cap(c_a), veh/h	311	2032	0	0	637	624	567	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	42.6	15.5	0.0	0.0	33.1	33.1	34.1	0.0	0.0			
Incr Delay (d2), s/veh	110.9	1.2	0.0	0.0	97.1	107.4	308.7	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	17.3	10.7	0.0	0.0	32.4	33.5	61.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	153.5	16.7	0.0	0.0	130.2	140.5	342.8	0.0	0.0			
LnGrp LOS	F	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1750			1506			946				
Approach Delay, s/veh		45.4			135.4			342.8				
Approach LOS		D			F			F				

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		63.6			22.0	41.6		39.6
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6
Max Green Setting (Gmax), s		59.0			18.0	37.0		35.0
Max Q Clear Time (g_c+I1), s		30.1			20.0	39.0		37.0
Green Ext Time (p_c), s		19.4			0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	144.6
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	994	409	287	1143	0	0	0	0	353	8	321
Future Volume (veh/h)	0	994	409	287	1143	0	0	0	0	353	8	321
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1362	560	322	1284	0				406	9	369
Peak Hour Factor	0.73	0.73	0.73	0.89	0.89	0.89				0.87	0.87	0.87
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1348	547	345	1142	0				262	6	238
Arrive On Green	0.00	0.38	0.38	0.19	0.61	0.00				0.30	0.30	0.30
Sat Flow, veh/h	0	3735	1447	1781	1870	0				872	19	793
Grp Volume(v), veh/h	0	1299	623	322	1284	0				784	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1610	1781	1870	0				1684	0	0
Q Serve(g_s), s	0.0	39.0	39.0	18.4	63.0	0.0				31.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	39.0	39.0	18.4	63.0	0.0				31.0	0.0	0.0
Prop In Lane	0.00		0.90	1.00		0.00				0.52		0.47
Lane Grp Cap(c), veh/h	0	1286	608	345	1142	0				506	0	0
V/C Ratio(X)	0.00	1.01	1.02	0.93	1.12	0.00				1.55	0.00	0.00
Avail Cap(c_a), veh/h	0	1286	608	345	1142	0				506	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	32.1	32.1	40.9	20.1	0.0				36.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	27.5	42.7	31.6	67.8	0.0				257.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	20.1	21.6	10.9	45.1	0.0				48.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	59.6	74.8	72.6	87.9	0.0				293.2	0.0	0.0
LnGrp LOS	A	F	F	E	F	A				F	A	A
Approach Vol, veh/h		1922			1606						784	
Approach Delay, s/veh		64.5			84.8						293.2	
Approach LOS		E			F						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	24.0	43.6		35.6		67.6						
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6						
Max Green Setting (Gmax), s	20.0	39.0		31.0		63.0						
Max Q Clear Time (g_c+I1), s	20.4	41.0		33.0		65.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0						
Intersection Summary												
HCM 6th Ctrl Delay			113.7									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	525	1220	0	0	1187	567	1236	6	469	0	0	0
Future Volume (veh/h)	525	1220	0	0	1187	567	1236	6	469	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	565	1312	0	0	1236	0	1288	6	489			
Peak Hour Factor	0.93	0.93	0.93	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	354	1628	0	0	822		844	4	754			
Arrive On Green	0.20	0.46	0.00	0.00	0.23	0.00	0.48	0.48	0.48			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1773	8	1585			
Grp Volume(v), veh/h	565	1312	0	0	1236	0	1294	0	489			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	29.8	47.6	0.0	0.0	34.7	0.0	71.4	0.0	35.1			
Cycle Q Clear(g_c), s	29.8	47.6	0.0	0.0	34.7	0.0	71.4	0.0	35.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	354	1628	0	0	822		848	0	754			
V/C Ratio(X)	1.60	0.81	0.00	0.00	1.50		1.53	0.00	0.65			
Avail Cap(c_a), veh/h	354	1628	0	0	822		848	0	754			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	60.1	34.9	0.0	0.0	57.6	0.0	39.3	0.0	29.8			
Incr Delay (d2), s/veh	281.4	3.2	0.0	0.0	232.9	0.0	242.6	0.0	1.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	40.8	20.5	0.0	0.0	41.8	0.0	86.7	0.0	13.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	341.5	38.2	0.0	0.0	290.6	0.0	281.9	0.0	31.7			
LnGrp LOS	F	D	A	A	F		F	A	C			
Approach Vol, veh/h		1877			1236			1783				
Approach Delay, s/veh		129.5			290.6			213.3				
Approach LOS		F			F			F				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		74.0			34.0	40.0		76.0				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		68.7			* 30	34.7		71.4				
Max Q Clear Time (g_c+I1), s		49.6			31.8	36.7		73.4				
Green Ext Time (p_c), s		11.5			0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	200.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1382	982	300	2123	0	0	0	0	363	1	652
Future Volume (veh/h)	0	1382	982	300	2123	0	0	0	0	363	1	652
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1502	1067	316	2235	0				491	1	881
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95				0.74	0.74	0.74
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	2168	673	247	1106	0				610	1	543
Arrive On Green	0.00	0.42	0.42	0.14	0.59	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	2	1584
Grp Volume(v), veh/h	0	1502	1067	316	2235	0				491	0	882
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1585
Q Serve(g_s), s	0.0	36.0	63.7	20.8	88.7	0.0				37.5	0.0	51.4
Cycle Q Clear(g_c), s	0.0	36.0	63.7	20.8	88.7	0.0				37.5	0.0	51.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2168	673	247	1106	0				610	0	543
V/C Ratio(X)	0.00	0.69	1.59	1.28	2.02	0.00				0.80	0.00	1.62
Avail Cap(c_a), veh/h	0	2168	673	247	1106	0				610	0	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	35.2	43.2	64.6	30.7	0.0				44.7	0.0	49.3
Incr Delay (d2), s/veh	0.0	1.0	270.4	153.1	462.6	0.0				7.9	0.0	289.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.7	74.4	19.8	178.6	0.0				17.5	0.0	63.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	36.1	313.5	217.7	493.2	0.0				52.6	0.0	338.3
LnGrp LOS	A	D	F	F	F	A				D	A	F
Approach Vol, veh/h		2569			2551						1373	
Approach Delay, s/veh		151.3			459.1						236.1	
Approach LOS		F			F						F	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	25.0	69.0		56.0		94.0
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3
Max Green Setting (Gmax), s	* 21	63.7		51.4		88.7
Max Q Clear Time (g_c+I1), s	22.8	65.7		53.4		90.7
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	290.2
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix H – 2040 Cumulative Conditions Level of Service Sheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	767	86	619	512	496	350	62	364	169	38	28
Future Volume (veh/h)	67	767	86	619	512	496	350	62	364	169	38	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	67	767	86	619	512	496	350	62	364	169	38	28
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	1141	509	420	1336	596	389	371	553	205	336	150
Arrive On Green	0.07	0.32	0.32	0.12	0.38	0.38	0.22	0.20	0.20	0.11	0.09	0.09
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	67	767	86	619	512	496	350	62	364	169	38	28
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	3.0	15.4	3.2	10.0	8.6	23.4	15.7	2.3	9.9	7.6	0.8	1.3
Cycle Q Clear(g_c), s	3.0	15.4	3.2	10.0	8.6	23.4	15.7	2.3	9.9	7.6	0.8	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	119	1141	509	420	1336	596	389	371	553	205	336	150
V/C Ratio(X)	0.56	0.67	0.17	1.47	0.38	0.83	0.90	0.17	0.66	0.83	0.11	0.19
Avail Cap(c_a), veh/h	217	2160	963	420	2160	963	433	1137	1696	217	1728	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.2	24.2	20.1	36.1	18.7	23.3	31.3	27.3	30.4	35.6	34.1	34.3
Incr Delay (d2), s/veh	4.1	0.7	0.2	225.7	0.2	3.4	20.0	0.2	1.3	21.5	0.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	6.2	1.1	17.2	3.4	8.1	8.3	1.0	3.1	4.5	0.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.4	24.9	20.2	261.8	18.9	26.8	51.3	27.6	31.7	57.1	34.2	34.9
LnGrp LOS	D	C	C	F	B	C	D	C	C	E	C	C
Approach Vol, veh/h		920			1627			776			235	
Approach Delay, s/veh		25.6			113.7			40.2			50.8	
Approach LOS		C			F			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.6	31.5	22.6	13.6	10.1	36.0	14.0	22.1				
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8				
Max Green Setting (Gmax), s	10.0	50.0	20.0	* 40	10.0	50.0	10.0	50.0				
Max Q Clear Time (g_c+I1), s	12.0	17.4	17.7	3.3	5.0	25.4	9.6	11.9				
Green Ext Time (p_c), s	0.0	6.2	0.3	0.3	0.0	5.5	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay			70.8									
HCM 6th LOS			E									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	4	412	28	3	12	152	705	7	28	380	63
Future Volume (veh/h)	127	4	412	28	3	12	152	705	7	28	380	63
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	4	412	28	3	12	152	705	7	28	380	63
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	5	526	77	90	360	198	1309	13	77	812	131
Arrive On Green	0.10	0.33	0.33	0.04	0.28	0.28	0.11	0.25	0.25	0.04	0.18	0.18
Sat Flow, veh/h	1781	15	1572	1781	327	1308	1781	5213	52	1781	4430	716
Grp Volume(v), veh/h	127	0	416	28	0	15	152	460	252	28	290	153
Grp Sat Flow(s),veh/h/ln	1781	0	1587	1781	0	1635	1781	1702	1861	1781	1702	1742
Q Serve(g_s), s	4.1	0.0	14.2	0.9	0.0	0.4	5.0	7.0	7.1	0.9	4.6	4.7
Cycle Q Clear(g_c), s	4.1	0.0	14.2	0.9	0.0	0.4	5.0	7.0	7.1	0.9	4.6	4.7
Prop In Lane	1.00		0.99	1.00		0.80	1.00		0.03	1.00		0.41
Lane Grp Cap(c), veh/h	182	0	531	77	0	450	198	855	467	77	624	319
V/C Ratio(X)	0.70	0.00	0.78	0.36	0.00	0.03	0.77	0.54	0.54	0.36	0.46	0.48
Avail Cap(c_a), veh/h	296	0	924	296	0	951	592	1981	1083	296	1415	724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	18.1	28.0	0.0	15.9	26.0	19.5	19.5	28.0	21.9	22.0
Incr Delay (d2), s/veh	4.7	0.0	3.6	2.8	0.0	0.0	6.1	0.8	1.4	2.8	0.8	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	5.3	0.4	0.0	0.1	2.2	2.4	2.7	0.4	1.6	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	21.7	30.8	0.0	16.0	32.1	20.3	20.9	30.8	22.7	23.6
LnGrp LOS	C	A	C	C	A	B	C	C	C	C	C	C
Approach Vol, veh/h		543			43			864			471	
Approach Delay, s/veh		23.8			25.6			22.5			23.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	24.8	11.3	16.8	10.8	21.3	7.2	20.9
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	2.9	16.2	7.0	6.7	6.1	2.4	2.9	9.1
Green Ext Time (p_c), s	0.0	3.9	0.3	3.2	0.1	0.1	0.0	6.1

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	430	1465	98	653	749	212	111	263	632	701	190	238
Future Volume (veh/h)	430	1465	98	653	749	212	111	263	632	701	190	238
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	430	1465	98	653	749	212	111	263	632	701	190	238
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	1396	433	590	1549	481	135	1215	664	590	1702	528
Arrive On Green	0.14	0.27	0.27	0.17	0.30	0.30	0.08	0.24	0.24	0.17	0.33	0.33
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	430	1465	98	653	749	212	111	263	632	701	190	238
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	17.9	40.0	7.0	25.0	17.5	15.7	9.0	6.1	32.7	25.0	3.8	17.2
Cycle Q Clear(g_c), s	17.9	40.0	7.0	25.0	17.5	15.7	9.0	6.1	32.7	25.0	3.8	17.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	487	1396	433	590	1549	481	135	1215	664	590	1702	528
V/C Ratio(X)	0.88	1.05	0.23	1.11	0.48	0.44	0.82	0.22	0.95	1.19	0.11	0.45
Avail Cap(c_a), veh/h	590	1396	433	590	1549	481	304	1221	667	590	1702	528
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.7	53.2	41.2	60.7	41.6	41.0	66.7	44.8	54.9	60.7	33.8	38.3
Incr Delay (d2), s/veh	13.0	38.2	0.3	69.5	0.2	0.6	11.8	0.1	23.5	100.5	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	21.6	2.7	16.4	7.3	6.1	4.5	2.5	13.4	18.9	1.5	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	91.4	41.4	130.2	41.8	41.6	78.5	44.9	78.5	161.2	33.8	38.9
LnGrp LOS	E	F	D	F	D	D	E	D	E	F	C	D
Approach Vol, veh/h		1993			1614			1006			1129	
Approach Delay, s/veh		85.3			77.6			69.7			114.0	
Approach LOS		F			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	46.0	15.6	54.8	25.6	50.4	29.5	40.8
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	27.0	42.0	11.0	19.2	19.9	19.5	27.0	34.7
Green Ext Time (p_c), s	0.0	0.0	0.2	1.6	0.7	5.4	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	86.0
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	313	50	20	4	25	124	7	413	8	102	442	131
Future Volume (veh/h)	313	50	20	4	25	124	7	413	8	102	442	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	313	50	20	4	25	124	7	413	8	102	442	131
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	384	613	520	8	219	185	13	1106	21	135	1444	448
Arrive On Green	0.22	0.33	0.33	0.00	0.12	0.12	0.01	0.21	0.21	0.08	0.28	0.28
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5157	100	1781	5106	1585
Grp Volume(v), veh/h	313	50	20	4	25	124	7	272	149	102	442	131
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1852	1781	1702	1585
Q Serve(g_s), s	8.9	1.0	0.5	0.1	0.6	4.0	0.2	3.6	3.6	3.0	3.6	3.4
Cycle Q Clear(g_c), s	8.9	1.0	0.5	0.1	0.6	4.0	0.2	3.6	3.6	3.0	3.6	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	384	613	520	8	219	185	13	730	397	135	1444	448
V/C Ratio(X)	0.82	0.08	0.04	0.52	0.11	0.67	0.53	0.37	0.37	0.76	0.31	0.29
Avail Cap(c_a), veh/h	673	883	748	673	883	748	673	1928	1049	673	2892	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	12.3	12.1	26.3	20.9	22.4	26.2	17.8	17.8	24.0	14.9	14.9
Incr Delay (d2), s/veh	4.3	0.1	0.0	45.3	0.2	4.1	29.4	1.1	2.1	8.4	0.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.4	0.1	0.1	0.3	1.5	0.2	1.3	1.5	1.4	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	12.3	12.1	71.7	21.2	26.6	55.6	18.9	19.9	32.4	15.3	16.2
LnGrp LOS	C	B	B	E	C	C	E	B	B	C	B	B
Approach Vol, veh/h		383			153			428			675	
Approach Delay, s/veh		21.9			26.9			19.9			18.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	22.4	4.9	21.0	15.9	11.2	8.5	17.4
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	3.0	2.2	5.6	10.9	6.0	5.0	5.6
Green Ext Time (p_c), s	0.0	0.3	0.0	7.7	0.7	0.5	0.2	5.7

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	1397	63	172	802	121	58	186	315	261	181	88
Future Volume (veh/h)	62	1397	63	172	802	121	58	186	315	261	181	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	1397	63	172	802	121	58	186	315	261	181	88
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	1630	74	200	1395	622	75	405	343	284	396	193
Arrive On Green	0.05	0.33	0.33	0.11	0.39	0.39	0.04	0.22	0.22	0.16	0.33	0.33
Sat Flow, veh/h	1781	5008	226	1781	3554	1585	1781	1870	1585	1781	1189	578
Grp Volume(v), veh/h	62	950	510	172	802	121	58	186	315	261	0	269
Grp Sat Flow(s),veh/h/ln	1781	1702	1830	1781	1777	1585	1781	1870	1585	1781	0	1766
Q Serve(g_s), s	4.3	32.8	32.8	11.9	22.2	6.3	4.0	10.9	24.4	18.1	0.0	15.0
Cycle Q Clear(g_c), s	4.3	32.8	32.8	11.9	22.2	6.3	4.0	10.9	24.4	18.1	0.0	15.0
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	80	1108	596	200	1395	622	75	405	343	284	0	589
V/C Ratio(X)	0.77	0.86	0.86	0.86	0.57	0.19	0.77	0.46	0.92	0.92	0.00	0.46
Avail Cap(c_a), veh/h	284	1356	729	284	1416	631	284	447	379	284	0	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	59.3	39.6	39.6	54.7	29.9	25.1	59.5	42.8	48.1	52.0	0.0	32.9
Incr Delay (d2), s/veh	14.2	4.1	7.3	16.8	0.7	0.2	15.0	0.8	25.5	33.1	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	14.1	15.7	6.1	9.3	2.4	2.1	5.1	11.9	10.6	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.5	43.7	46.9	71.5	30.6	25.3	74.5	43.6	73.6	85.1	0.0	33.4
LnGrp LOS	E	D	D	E	C	C	E	D	E	F	A	C
Approach Vol, veh/h		1522			1095			559			530	
Approach Delay, s/veh		46.0			36.4			63.7			58.9	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.4	46.9	10.9	48.4	11.0	55.3	25.6	33.7
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	13.9	34.8	6.0	17.0	6.3	24.2	20.1	26.4
Green Ext Time (p_c), s	0.2	6.1	0.1	1.2	0.1	8.4	0.0	0.8

Intersection Summary		
HCM 6th Ctrl Delay		47.7
HCM 6th LOS		D

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	0	1	71	173	1	28	50	115	166	49	161	0
Future Vol, veh/h	0	1	71	173	1	28	50	115	166	49	161	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	71	173	1	28	50	115	166	49	161	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	10.9	11.4	10.5
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	0%	86%	23%
Vol Thru, %	35%	1%	0%	77%
Vol Right, %	50%	99%	14%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	331	72	202	210
LT Vol	50	0	173	49
Through Vol	115	1	1	161
RT Vol	166	71	28	0
Lane Flow Rate	331	72	202	210
Geometry Grp	1	1	1	1
Degree of Util (X)	0.437	0.101	0.307	0.304
Departure Headway (Hd)	4.748	5.048	5.48	5.204
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	761	708	656	693
Service Time	2.755	3.088	3.514	3.215
HCM Lane V/C Ratio	0.435	0.102	0.308	0.303
HCM Control Delay	11.4	8.7	10.9	10.5
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	2.2	0.3	1.3	1.3

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	32	16	36	41	1
Future Vol, veh/h	0	32	16	36	41	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	32	16	36	41	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	52	0	-	0	66	34
Stage 1	-	-	-	-	34	-
Stage 2	-	-	-	-	32	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1554	-	-	-	939	1039
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	991	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1554	-	-	-	939	1039
Mov Cap-2 Maneuver	-	-	-	-	939	-
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	991	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1554	-	-	-	941
HCM Lane V/C Ratio	-	-	-	-	0.045
HCM Control Delay (s)	0	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	5	17	243	220	5
Future Vol, veh/h	8	5	17	243	220	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	5	17	243	220	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	500	223	225	0	-	0
Stage 1	223	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	530	817	1344	-	-	-
Stage 1	814	-	-	-	-	-
Stage 2	770	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	522	817	1344	-	-	-
Mov Cap-2 Maneuver	522	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	770	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1344	-	606	-	-
HCM Lane V/C Ratio	0.013	-	0.021	-	-
HCM Control Delay (s)	7.7	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	306	1135	0	0	1313	391	488	0	406	0	0	0
Future Volume (veh/h)	306	1135	0	0	1313	391	488	0	406	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	306	1135	0	0	1313	391	488	0	406			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	336	2022	0	0	928	269	314	0	261			
Arrive On Green	0.19	0.57	0.00	0.00	0.34	0.34	0.34	0.00	0.34			
Sat Flow, veh/h	1781	3647	0	0	2812	787	921	0	766			
Grp Volume(v), veh/h	306	1135	0	0	845	859	894	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1729	1686	0	0			
Q Serve(g_s), s	17.3	20.7	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	17.3	20.7	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.46	0.55		0.45			
Lane Grp Cap(c), veh/h	336	2022	0	0	607	590	576	0	0			
V/C Ratio(X)	0.91	0.56	0.00	0.00	1.39	1.46	1.55	0.00	0.00			
Avail Cap(c_a), veh/h	347	2045	0	0	607	590	576	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	40.8	14.0	0.0	0.0	33.8	33.8	33.8	0.0	0.0			
Incr Delay (d2), s/veh	26.7	0.6	0.0	0.0	186.9	214.3	257.3	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	9.9	7.8	0.0	0.0	45.9	49.2	54.4	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.5	14.5	0.0	0.0	220.7	248.1	291.1	0.0	0.0			
LnGrp LOS	E	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1441			1704			894				
Approach Delay, s/veh		25.8			234.5			291.1				
Approach LOS		C			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		62.9			23.3	39.6		39.6				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0				
Max Q Clear Time (g_c+I1), s		22.7			19.3	37.0		37.0				
Green Ext Time (p_c), s		17.9			0.1	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			172.6									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1071	447	412	1389	0	0	0	0	369	5	261
Future Volume (veh/h)	0	1071	447	412	1389	0	0	0	0	369	5	261
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1071	447	412	1389	0				369	5	261
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1199	500	345	1069	0				334	5	236
Arrive On Green	0.00	0.34	0.34	0.19	0.57	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	3703	1475	1781	1870	0				985	13	697
Grp Volume(v), veh/h	0	1032	486	412	1389	0				635	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1605	1781	1870	0				1696	0	0
Q Serve(g_s), s	0.0	29.7	29.7	20.0	59.0	0.0				35.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	29.7	29.7	20.0	59.0	0.0				35.0	0.0	0.0
Prop In Lane	0.00		0.92	1.00		0.00				0.58		0.41
Lane Grp Cap(c), veh/h	0	1154	544	345	1069	0				575	0	0
V/C Ratio(X)	0.00	0.89	0.89	1.19	1.30	0.00				1.10	0.00	0.00
Avail Cap(c_a), veh/h	0	1154	544	345	1069	0				575	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	32.3	32.3	41.6	22.1	0.0				34.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	9.6	17.8	112.1	141.5	0.0				69.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.2	13.7	19.3	64.9	0.0				24.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	41.9	50.1	153.7	163.6	0.0				103.4	0.0	0.0
LnGrp LOS	A	D	D	F	F	A				F	A	A
Approach Vol, veh/h		1518			1801						635	
Approach Delay, s/veh		44.5			161.3						103.4	
Approach LOS		D			F						F	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	24.0	39.6		39.6		63.6
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6
Max Green Setting (Gmax), s	20.0	35.0		35.0		59.0
Max Q Clear Time (g_c+I1), s	22.0	31.7		37.0		61.0
Green Ext Time (p_c), s	0.0	3.0		0.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		107.2
HCM 6th LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	718	1312	0	0	1040	426	837	5	538	0	0	0
Future Volume (veh/h)	718	1312	0	0	1040	426	837	5	538	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	718	1312	0	0	1040	0	837	5	538			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	376	2021	0	0	1114		579	3	518			
Arrive On Green	0.21	0.57	0.00	0.00	0.31	0.00	0.33	0.33	0.33			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1771	11	1585			
Grp Volume(v), veh/h	718	1312	0	0	1040	0	842	0	538			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	20.0	23.9	0.0	0.0	26.9	0.0	31.0	0.0	31.0			
Cycle Q Clear(g_c), s	20.0	23.9	0.0	0.0	26.9	0.0	31.0	0.0	31.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	376	2021	0	0	1114		583	0	518			
V/C Ratio(X)	1.91	0.65	0.00	0.00	0.93		1.45	0.00	1.04			
Avail Cap(c_a), veh/h	376	2031	0	0	1124		583	0	518			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	37.4	14.0	0.0	0.0	31.6	0.0	31.9	0.0	31.9			
Incr Delay (d2), s/veh	419.7	0.8	0.0	0.0	13.9	0.0	210.0	0.0	49.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	52.0	8.3	0.0	0.0	12.8	0.0	46.2	0.0	18.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	457.1	14.8	0.0	0.0	45.5	0.0	241.9	0.0	81.7			
LnGrp LOS	F	B	A	A	D		F	A	F			
Approach Vol, veh/h		2030			1040			1380				
Approach Delay, s/veh		171.3			45.5			179.4				
Approach LOS		F			D			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		59.2			24.2	35.0		35.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		25.9			22.0	28.9		33.0				
Green Ext Time (p_c), s		14.6			0.0	0.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay	144.4
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1512	1312	368	1508	0	0	0	0	517	0	544
Future Volume (veh/h)	0	1512	1312	368	1508	0	0	0	0	517	0	544
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1512	1312	368	1508	0				517	0	544
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1314	408	298	895	0				702	0	625
Arrive On Green	0.00	0.26	0.26	0.17	0.48	0.00				0.39	0.00	0.39
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	0	1585
Grp Volume(v), veh/h	0	1512	1312	368	1508	0				517	0	544
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1585
Q Serve(g_s), s	0.0	20.0	20.0	13.0	37.2	0.0				19.3	0.0	24.6
Cycle Q Clear(g_c), s	0.0	20.0	20.0	13.0	37.2	0.0				19.3	0.0	24.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1314	408	298	895	0				702	0	625
V/C Ratio(X)	0.00	1.15	3.22	1.24	1.68	0.00				0.74	0.00	0.87
Avail Cap(c_a), veh/h	0	1314	408	298	895	0				802	0	714
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	28.9	28.9	32.4	20.3	0.0				20.1	0.0	21.7
Incr Delay (d2), s/veh	0.0	77.0	1003.9	131.4	312.9	0.0				3.3	0.0	10.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.7	120.6	16.0	91.0	0.0				7.6	0.0	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	105.9	1032.7	163.7	333.2	0.0				23.4	0.0	32.4
LnGrp LOS	A	F	F	F	F	A				C	A	C
Approach Vol, veh/h		2824			1876						1061	
Approach Delay, s/veh		536.5			299.9						28.0	
Approach LOS		F			F						C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	17.2	25.3		35.2		42.5
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3
Max Green Setting (Gmax), s	* 13	20.0		35.0		37.2
Max Q Clear Time (g_c+I1), s	15.0	22.0		26.6		39.2
Green Ext Time (p_c), s	0.0	0.0		4.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		365.8
HCM 6th LOS		F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	541	94	838	537	450	348	193	414	429	65	54
Future Volume (veh/h)	110	541	94	838	537	450	348	193	414	429	65	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	110	541	94	838	537	450	348	193	414	429	65	54
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	1093	488	416	1241	554	387	392	584	215	401	179
Arrive On Green	0.08	0.31	0.31	0.12	0.35	0.35	0.22	0.21	0.21	0.12	0.11	0.11
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	110	541	94	838	537	450	348	193	414	429	65	54
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	5.0	10.3	3.6	10.0	9.6	21.4	15.8	7.6	11.4	10.0	1.4	2.6
Cycle Q Clear(g_c), s	5.0	10.3	3.6	10.0	9.6	21.4	15.8	7.6	11.4	10.0	1.4	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	140	1093	488	416	1241	554	387	392	584	215	401	179
V/C Ratio(X)	0.78	0.49	0.19	2.01	0.43	0.81	0.90	0.49	0.71	2.00	0.16	0.30
Avail Cap(c_a), veh/h	215	2140	955	416	2140	955	429	1126	1680	215	1712	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	23.5	21.2	36.5	20.7	24.5	31.6	28.9	30.5	36.5	33.3	33.8
Incr Delay (d2), s/veh	10.0	0.3	0.2	464.4	0.2	2.9	20.3	1.0	1.6	465.9	0.2	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.2	1.2	30.9	3.8	7.5	8.3	3.2	3.6	31.8	0.6	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.6	23.8	21.3	500.9	20.9	27.5	51.9	29.9	32.1	502.4	33.5	34.8
LnGrp LOS	D	C	C	F	C	C	D	C	C	F	C	C
Approach Vol, veh/h		745			1825			955			548	
Approach Delay, s/veh		27.0			242.9			38.9			400.7	
Approach LOS		C			F			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.6	30.6	22.6	15.2	11.1	34.1	14.6	23.2				
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8				
Max Green Setting (Gmax), s	10.0	50.0	20.0	* 40	10.0	50.0	10.0	50.0				
Max Q Clear Time (g_c+I1), s	12.0	12.3	17.8	4.6	7.0	23.4	12.0	13.4				
Green Ext Time (p_c), s	0.0	4.2	0.2	0.5	0.1	5.6	0.0	2.7				
Intersection Summary												
HCM 6th Ctrl Delay			176.8									
HCM 6th LOS			F									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	17	348	84	29	28	326	830	40	53	581	70
Future Volume (veh/h)	99	17	348	84	29	28	326	830	40	53	581	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	99	17	348	84	29	28	326	830	40	53	581	70
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	21	422	132	239	231	369	1703	82	108	901	107
Arrive On Green	0.08	0.28	0.28	0.07	0.27	0.27	0.21	0.34	0.34	0.06	0.19	0.19
Sat Flow, veh/h	1781	74	1522	1781	874	844	1781	4991	240	1781	4625	551
Grp Volume(v), veh/h	99	0	365	84	0	57	326	565	305	53	426	225
Grp Sat Flow(s),veh/h/ln	1781	0	1596	1781	0	1718	1781	1702	1827	1781	1702	1771
Q Serve(g_s), s	4.3	0.0	17.1	3.7	0.0	2.0	14.2	10.5	10.5	2.3	9.2	9.4
Cycle Q Clear(g_c), s	4.3	0.0	17.1	3.7	0.0	2.0	14.2	10.5	10.5	2.3	9.2	9.4
Prop In Lane	1.00		0.95	1.00		0.49	1.00		0.13	1.00		0.31
Lane Grp Cap(c), veh/h	139	0	443	132	0	470	369	1162	624	108	663	345
V/C Ratio(X)	0.71	0.00	0.82	0.64	0.00	0.12	0.88	0.49	0.49	0.49	0.64	0.65
Avail Cap(c_a), veh/h	223	0	699	223	0	753	446	1491	800	223	1065	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	0.0	27.0	35.9	0.0	21.8	30.8	20.8	20.8	36.3	29.6	29.7
Incr Delay (d2), s/veh	6.6	0.0	6.0	5.0	0.0	0.2	16.4	0.5	0.8	3.4	1.5	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	7.1	1.8	0.0	0.8	7.2	3.7	4.1	1.0	3.6	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	0.0	33.0	41.0	0.0	22.0	47.2	21.2	21.6	39.8	31.1	32.6
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	C	C
Approach Vol, veh/h		464			141			1196			704	
Approach Delay, s/veh		35.1			33.3			28.4			32.2	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	26.9	21.1	21.4	10.8	26.6	9.4	33.1
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	5.7	19.1	16.2	11.4	6.3	4.0	4.3	12.5
Green Ext Time (p_c), s	0.1	3.1	0.4	4.2	0.1	0.4	0.0	7.3

Intersection Summary	
HCM 6th Ctrl Delay	31.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	653	1330	157	982	1508	464	224	309	618	739	256	445
Future Volume (veh/h)	653	1330	157	982	1508	464	224	309	618	739	256	445
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	653	1330	157	982	1508	464	224	309	618	739	256	445
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	592	1400	435	592	1400	435	248	1203	657	592	1367	424
Arrive On Green	0.17	0.27	0.27	0.17	0.27	0.27	0.14	0.24	0.24	0.17	0.27	0.27
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	653	1330	157	982	1508	464	224	309	618	739	256	445
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	25.0	37.3	11.6	25.0	40.0	40.0	18.1	7.2	31.7	25.0	5.6	39.0
Cycle Q Clear(g_c), s	25.0	37.3	11.6	25.0	40.0	40.0	18.1	7.2	31.7	25.0	5.6	39.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	592	1400	435	592	1400	435	248	1203	657	592	1367	424
V/C Ratio(X)	1.10	0.95	0.36	1.66	1.08	1.07	0.90	0.26	0.94	1.25	0.19	1.05
Avail Cap(c_a), veh/h	592	1400	435	592	1400	435	305	1225	669	592	1367	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.4	51.9	42.6	60.4	52.9	52.9	61.8	45.4	54.7	60.4	41.2	53.4
Incr Delay (d2), s/veh	68.2	13.9	0.5	303.6	47.7	62.3	25.0	0.1	21.2	125.1	0.1	57.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.3	17.3	4.6	35.7	22.8	23.0	9.7	3.0	12.8	20.9	2.3	21.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	128.7	65.8	43.1	364.0	100.6	115.2	86.8	45.5	76.0	185.5	41.2	110.5
LnGrp LOS	F	E	D	F	F	F	F	D	E	F	D	F
Approach Vol, veh/h		2140			2954			1151			1440	
Approach Delay, s/veh		83.3			190.5			69.9			136.7	
Approach LOS		F			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	46.0	24.8	45.0	30.0	46.0	29.5	40.4
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	27.0	39.3	20.1	41.0	27.0	42.0	27.0	33.7
Green Ext Time (p_c), s	0.0	0.6	0.3	0.0	0.0	0.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	132.5
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	20	13	4	48	111	1	460	1	160	471	185
Future Volume (veh/h)	170	20	13	4	48	111	1	460	1	160	471	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	170	20	13	4	48	111	1	460	1	160	471	185
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	225	435	369	8	206	175	4	1266	3	212	1830	568
Arrive On Green	0.13	0.23	0.23	0.00	0.11	0.11	0.00	0.24	0.24	0.12	0.36	0.36
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5261	11	1781	5106	1585
Grp Volume(v), veh/h	170	20	13	4	48	111	1	298	163	160	471	185
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1868	1781	1702	1585
Q Serve(g_s), s	4.6	0.4	0.3	0.1	1.2	3.3	0.0	3.6	3.6	4.3	3.2	4.2
Cycle Q Clear(g_c), s	4.6	0.4	0.3	0.1	1.2	3.3	0.0	3.6	3.6	4.3	3.2	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	225	435	369	8	206	175	4	819	450	212	1830	568
V/C Ratio(X)	0.75	0.05	0.04	0.52	0.23	0.63	0.28	0.36	0.36	0.76	0.26	0.33
Avail Cap(c_a), veh/h	719	944	800	719	944	800	719	2061	1131	719	3091	960
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	14.8	14.7	24.6	20.1	21.1	24.7	15.7	15.7	21.1	11.2	11.5
Incr Delay (d2), s/veh	5.1	0.0	0.0	45.1	0.6	3.8	37.4	1.0	1.8	5.4	0.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.2	0.1	0.1	0.5	1.2	0.0	1.2	1.5	1.8	1.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.0	14.8	14.8	69.7	20.7	24.9	62.1	16.6	17.4	26.5	11.5	12.7
LnGrp LOS	C	B	B	E	C	C	E	B	B	C	B	B
Approach Vol, veh/h		203			163			462			816	
Approach Delay, s/veh		24.2			24.7			17.0			14.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	16.5	4.6	23.8	10.8	10.5	10.4	17.9
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	2.4	2.0	6.2	6.6	5.3	6.3	5.6
Green Ext Time (p_c), s	0.0	0.1	0.0	8.7	0.4	0.5	0.3	6.3

Intersection Summary		
HCM 6th Ctrl Delay		17.5
HCM 6th LOS		B

Notes
User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1631	87	298	1599	280	30	46	285	218	48	36
Future Volume (veh/h)	83	1631	87	298	1599	280	30	46	285	218	48	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	83	1631	87	298	1599	280	30	46	285	218	48	36
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	1755	94	260	1566	698	44	364	308	242	303	227
Arrive On Green	0.06	0.35	0.35	0.15	0.44	0.44	0.02	0.19	0.19	0.14	0.31	0.31
Sat Flow, veh/h	1781	4962	265	1781	3554	1585	1781	1870	1585	1781	992	744
Grp Volume(v), veh/h	83	1119	599	298	1599	280	30	46	285	218	0	84
Grp Sat Flow(s),veh/h/ln	1781	1702	1823	1781	1777	1585	1781	1870	1585	1781	0	1736
Q Serve(g_s), s	6.3	43.4	43.5	20.0	60.5	16.5	2.3	2.8	24.2	16.5	0.0	4.8
Cycle Q Clear(g_c), s	6.3	43.4	43.5	20.0	60.5	16.5	2.3	2.8	24.2	16.5	0.0	4.8
Prop In Lane	1.00		0.15	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	105	1204	645	260	1566	698	44	364	308	242	0	530
V/C Ratio(X)	0.79	0.93	0.93	1.15	1.02	0.40	0.68	0.13	0.92	0.90	0.00	0.16
Avail Cap(c_a), veh/h	260	1240	664	260	1566	698	260	409	346	260	0	530
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.8	42.7	42.7	58.6	38.4	26.1	66.4	45.7	54.3	58.4	0.0	34.8
Incr Delay (d2), s/veh	12.5	11.7	19.0	101.9	28.3	0.5	16.6	0.2	28.3	30.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	19.9	22.6	16.2	31.0	6.3	1.2	1.3	12.0	9.4	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.2	54.4	61.7	160.5	66.7	26.6	83.0	45.8	82.6	88.8	0.0	34.9
LnGrp LOS	E	D	E	F	F	C	F	D	F	F	A	C
Approach Vol, veh/h		1801			2177			361			302	
Approach Delay, s/veh		57.9			74.4			77.9			73.8	
Approach LOS		E			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.3	54.6	9.0	48.4	13.4	66.5	24.2	33.2
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	22.0	45.5	4.3	6.8	8.3	62.5	18.5	26.2
Green Ext Time (p_c), s	0.0	3.1	0.0	0.4	0.1	0.0	0.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	68.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	0	5	59	152	11	37	49	84	117	33	53	0
Future Vol, veh/h	0	5	59	152	11	37	49	84	117	33	53	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	5	59	152	11	37	49	84	117	33	53	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	9.6	9.5	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	0%	76%	38%
Vol Thru, %	34%	8%	5%	62%
Vol Right, %	47%	92%	18%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	64	200	86
LT Vol	49	0	152	33
Through Vol	84	5	11	53
RT Vol	117	59	37	0
Lane Flow Rate	250	64	200	86
Geometry Grp	1	1	1	1
Degree of Util (X)	0.308	0.078	0.268	0.118
Departure Headway (Hd)	4.434	4.413	4.823	4.935
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	808	806	742	723
Service Time	2.473	2.468	2.868	2.985
HCM Lane V/C Ratio	0.309	0.079	0.27	0.119
HCM Control Delay	9.5	7.8	9.6	8.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.3	0.3	1.1	0.4

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	32	15	34	36	4
Future Vol, veh/h	0	32	15	34	36	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	32	15	34	36	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	49	0	-	0	64	32
Stage 1	-	-	-	-	32	-
Stage 2	-	-	-	-	32	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1558	-	-	-	942	1042
Stage 1	-	-	-	-	991	-
Stage 2	-	-	-	-	991	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1558	-	-	-	942	1042
Mov Cap-2 Maneuver	-	-	-	-	942	-
Stage 1	-	-	-	-	991	-
Stage 2	-	-	-	-	991	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1558	-	-	-	951
HCM Lane V/C Ratio	-	-	-	-	0.042
HCM Control Delay (s)	0	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	0.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	12	16	187	226	7
Future Vol, veh/h	12	12	16	187	226	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	12	16	187	226	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	449	230	233	0	-	0
Stage 1	230	-	-	-	-	-
Stage 2	219	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	568	809	1335	-	-	-
Stage 1	808	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	561	809	1335	-	-	-
Mov Cap-2 Maneuver	561	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	817	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1335	-	663	-	-
HCM Lane V/C Ratio	0.012	-	0.036	-	-
HCM Control Delay (s)	7.7	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	331	1383	0	0	1370	363	482	7	559	0	0	0
Future Volume (veh/h)	331	1383	0	0	1370	363	482	7	559	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	331	1383	0	0	1370	363	482	7	559			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	345	2032	0	0	948	245	261	4	302			
Arrive On Green	0.19	0.57	0.00	0.00	0.34	0.34	0.34	0.34	0.34			
Sat Flow, veh/h	1781	3647	0	0	2890	721	769	11	892			
Grp Volume(v), veh/h	331	1383	0	0	857	876	1048	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1741	1671	0	0			
Q Serve(g_s), s	19.0	28.2	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	19.0	28.2	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.41	0.46		0.53			
Lane Grp Cap(c), veh/h	345	2032	0	0	603	590	567	0	0			
V/C Ratio(X)	0.96	0.68	0.00	0.00	1.42	1.48	1.85	0.00	0.00			
Avail Cap(c_a), veh/h	345	2032	0	0	603	590	567	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	41.2	15.5	0.0	0.0	34.1	34.1	34.1	0.0	0.0			
Incr Delay (d2), s/veh	37.5	1.2	0.0	0.0	199.3	227.0	388.7	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.7	10.7	0.0	0.0	47.8	51.4	74.4	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.7	16.7	0.0	0.0	233.4	261.1	422.8	0.0	0.0			
LnGrp LOS	E	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1714			1733			1048				
Approach Delay, s/veh		28.7			247.4			422.8				
Approach LOS		C			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		63.6			24.0	39.6		39.6				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0				
Max Q Clear Time (g_c+I1), s		30.2			21.0	37.0		37.0				
Green Ext Time (p_c), s		19.4			0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	204.9
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1248	540	379	1473	0	0	0	0	466	11	352
Future Volume (veh/h)	0	1248	540	379	1473	0	0	0	0	466	11	352
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1248	540	379	1473	0				466	11	352
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1187	510	345	1069	0				323	8	244
Arrive On Green	0.00	0.34	0.34	0.19	0.57	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	3668	1504	1781	1870	0				952	22	719
Grp Volume(v), veh/h	0	1214	574	379	1473	0				829	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1600	1781	1870	0				1693	0	0
Q Serve(g_s), s	0.0	35.0	35.0	20.0	59.0	0.0				35.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	35.0	35.0	20.0	59.0	0.0				35.0	0.0	0.0
Prop In Lane	0.00		0.94	1.00		0.00				0.56		0.42
Lane Grp Cap(c), veh/h	0	1154	543	345	1069	0				574	0	0
V/C Ratio(X)	0.00	1.05	1.06	1.10	1.38	0.00				1.44	0.00	0.00
Avail Cap(c_a), veh/h	0	1154	543	345	1069	0				574	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	34.1	34.1	41.6	22.1	0.0				34.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	41.0	55.2	77.3	175.8	0.0				209.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	20.4	21.3	16.0	75.1	0.0				46.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	75.1	89.3	118.9	197.9	0.0				243.4	0.0	0.0
LnGrp LOS	A	F	F	F	F	A				F	A	A
Approach Vol, veh/h		1788			1852						829	
Approach Delay, s/veh		79.7			181.8						243.4	
Approach LOS		E			F						F	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	24.0	39.6		39.6		63.6
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6
Max Green Setting (Gmax), s	20.0	35.0		35.0		59.0
Max Q Clear Time (g_c+I1), s	22.0	37.0		37.0		61.0
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	152.3
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	588	1546	0	0	1459	748	1417	8	619	0	0	0
Future Volume (veh/h)	588	1546	0	0	1459	748	1417	8	619	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	588	1546	0	0	1459	0	1417	8	619			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	375	2025	0	0	1121		578	3	517			
Arrive On Green	0.21	0.57	0.00	0.00	0.32	0.00	0.33	0.33	0.33			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1772	10	1585			
Grp Volume(v), veh/h	588	1546	0	0	1459	0	1425	0	619			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	20.0	31.5	0.0	0.0	30.0	0.0	31.0	0.0	31.0			
Cycle Q Clear(g_c), s	20.0	31.5	0.0	0.0	30.0	0.0	31.0	0.0	31.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	375	2025	0	0	1121		581	0	517			
V/C Ratio(X)	1.57	0.76	0.00	0.00	1.30		2.45	0.00	1.20			
Avail Cap(c_a), veh/h	375	2025	0	0	1121		581	0	517			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	37.5	15.6	0.0	0.0	32.5	0.0	32.1	0.0	32.0			
Incr Delay (d2), s/veh	268.9	1.9	0.0	0.0	142.3	0.0	659.3	0.0	106.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	36.2	11.2	0.0	0.0	34.0	0.0	118.6	0.0	26.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	306.5	17.5	0.0	0.0	174.8	0.0	691.3	0.0	138.8			
LnGrp LOS	F	B	A	A	F		F	A	F			
Approach Vol, veh/h		2134			1459			2044				
Approach Delay, s/veh		97.1			174.8			524.0				
Approach LOS		F			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		59.5			24.2	35.3		35.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		33.5			22.0	32.0		33.0				
Green Ext Time (p_c), s		14.2			0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	272.0
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1656	1170	396	2481	0	0	0	0	479	0	682
Future Volume (veh/h)	0	1656	1170	396	2481	0	0	0	0	479	0	682
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1656	1170	396	2481	0				479	0	682
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1244	386	282	847	0				759	0	676
Arrive On Green	0.00	0.24	0.24	0.16	0.45	0.00				0.43	0.00	0.43
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	0	1585
Grp Volume(v), veh/h	0	1656	1170	396	2481	0				479	0	682
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1585
Q Serve(g_s), s	0.0	20.0	20.0	13.0	37.2	0.0				17.3	0.0	35.0
Cycle Q Clear(g_c), s	0.0	20.0	20.0	13.0	37.2	0.0				17.3	0.0	35.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1244	386	282	847	0				759	0	676
V/C Ratio(X)	0.00	1.33	3.03	1.40	2.93	0.00				0.63	0.00	1.01
Avail Cap(c_a), veh/h	0	1244	386	282	847	0				759	0	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.1	31.0	34.5	22.4	0.0				18.5	0.0	23.6
Incr Delay (d2), s/veh	0.0	154.7	920.4	201.8	870.6	0.0				1.8	0.0	36.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	25.3	105.7	21.0	218.7	0.0				6.6	0.0	18.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	185.8	951.5	236.3	893.1	0.0				20.3	0.0	60.5
LnGrp LOS	A	F	F	F	F	A				C	A	F
Approach Vol, veh/h		2826			2877						1161	
Approach Delay, s/veh		502.8			802.7						43.9	
Approach LOS		F			F						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.2	25.3		39.6		42.5						
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3						
Max Green Setting (Gmax), s	* 13	20.0		35.0		37.2						
Max Q Clear Time (g_c+I1), s	15.0	22.0		37.0		39.2						
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0						

Intersection Summary	
HCM 6th Ctrl Delay	550.9
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Appendix I – 2040 Cumulative Conditions plus Project Level of Service Sheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	814	86	627	529	496	350	62	388	169	38	28
Future Volume (veh/h)	67	814	86	627	529	496	350	62	388	169	38	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	67	814	86	627	529	496	350	62	388	169	38	28
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	119	1145	511	419	1339	597	389	371	553	204	336	150
Arrive On Green	0.07	0.32	0.32	0.12	0.38	0.38	0.22	0.20	0.20	0.11	0.09	0.09
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	67	814	86	627	529	496	350	62	388	169	38	28
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	3.0	16.6	3.2	10.0	9.0	23.4	15.8	2.3	10.7	7.7	0.8	1.3
Cycle Q Clear(g_c), s	3.0	16.6	3.2	10.0	9.0	23.4	15.8	2.3	10.7	7.7	0.8	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	119	1145	511	419	1339	597	389	371	553	204	336	150
V/C Ratio(X)	0.56	0.71	0.17	1.50	0.40	0.83	0.90	0.17	0.70	0.83	0.11	0.19
Avail Cap(c_a), veh/h	216	2154	961	419	2154	961	432	1134	1691	216	1723	769
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	24.6	20.0	36.2	18.8	23.3	31.4	27.4	30.8	35.7	34.2	34.4
Incr Delay (d2), s/veh	4.2	0.8	0.2	235.7	0.2	3.4	20.2	0.2	1.6	21.6	0.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	6.7	1.1	17.8	3.5	8.1	8.3	1.0	3.4	4.5	0.3	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	25.4	20.2	272.0	19.0	26.7	51.5	27.6	32.4	57.3	34.3	35.0
LnGrp LOS	D	C	C	F	B	C	D	C	C	E	C	D
Approach Vol, veh/h		967			1652			800			235	
Approach Delay, s/veh		26.1			117.3			40.4			51.0	
Approach LOS		C			F			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.6	31.7	22.6	13.6	10.1	36.2	14.1	22.1				
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8				
Max Green Setting (Gmax), s	10.0	50.0	20.0	* 40	10.0	50.0	10.0	50.0				
Max Q Clear Time (g_c+I1), s	12.0	18.6	17.8	3.3	5.0	25.4	9.7	12.7				
Green Ext Time (p_c), s	0.0	6.6	0.3	0.3	0.0	5.7	0.0	1.9				

Intersection Summary			
HCM 6th Ctrl Delay			72.1
HCM 6th LOS			E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	4	412	28	3	12	152	705	7	28	380	71
Future Volume (veh/h)	151	4	412	28	3	12	152	705	7	28	380	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	151	4	412	28	3	12	152	705	7	28	380	71
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	5	526	77	88	353	198	1309	13	77	796	145
Arrive On Green	0.11	0.33	0.33	0.04	0.27	0.27	0.11	0.25	0.25	0.04	0.18	0.18
Sat Flow, veh/h	1781	15	1572	1781	327	1308	1781	5213	52	1781	4344	789
Grp Volume(v), veh/h	151	0	416	28	0	15	152	460	252	28	295	156
Grp Sat Flow(s),veh/h/ln	1781	0	1587	1781	0	1635	1781	1702	1861	1781	1702	1728
Q Serve(g_s), s	5.0	0.0	14.2	0.9	0.0	0.4	5.0	7.0	7.1	0.9	4.7	4.9
Cycle Q Clear(g_c), s	5.0	0.0	14.2	0.9	0.0	0.4	5.0	7.0	7.1	0.9	4.7	4.9
Prop In Lane	1.00		0.99	1.00		0.80	1.00		0.03	1.00		0.46
Lane Grp Cap(c), veh/h	193	0	531	77	0	441	198	855	467	77	624	317
V/C Ratio(X)	0.78	0.00	0.78	0.36	0.00	0.03	0.77	0.54	0.54	0.36	0.47	0.49
Avail Cap(c_a), veh/h	296	0	924	296	0	951	592	1981	1083	296	1415	718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	18.1	28.0	0.0	16.2	26.0	19.5	19.5	28.0	22.0	22.1
Incr Delay (d2), s/veh	7.3	0.0	3.6	2.8	0.0	0.0	6.1	0.8	1.4	2.8	0.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	5.3	0.4	0.0	0.2	2.2	2.4	2.7	0.4	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.4	0.0	21.7	30.8	0.0	16.2	32.1	20.3	20.9	30.8	22.8	23.7
LnGrp LOS	C	A	C	C	A	B	C	C	C	C	C	C
Approach Vol, veh/h		567			43			864			479	
Approach Delay, s/veh		24.8			25.7			22.5			23.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	24.8	11.3	16.8	11.1	20.9	7.2	20.9
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	2.9	16.2	7.0	6.9	7.0	2.4	2.9	9.1
Green Ext Time (p_c), s	0.0	3.9	0.3	3.2	0.1	0.1	0.0	6.1

Intersection Summary	
HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	430	1795	98	653	865	212	111	263	632	701	190	238
Future Volume (veh/h)	430	1795	98	653	865	212	111	263	632	701	190	238
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	430	1795	98	653	865	212	111	263	632	701	190	238
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	1396	433	590	1549	481	135	1215	664	590	1702	528
Arrive On Green	0.14	0.27	0.27	0.17	0.30	0.30	0.08	0.24	0.24	0.17	0.33	0.33
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	430	1795	98	653	865	212	111	263	632	701	190	238
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	17.9	40.0	7.0	25.0	20.8	15.7	9.0	6.1	32.7	25.0	3.8	17.2
Cycle Q Clear(g_c), s	17.9	40.0	7.0	25.0	20.8	15.7	9.0	6.1	32.7	25.0	3.8	17.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	487	1396	433	590	1549	481	135	1215	664	590	1702	528
V/C Ratio(X)	0.88	1.29	0.23	1.11	0.56	0.44	0.82	0.22	0.95	1.19	0.11	0.45
Avail Cap(c_a), veh/h	590	1396	433	590	1549	481	304	1221	667	590	1702	528
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.7	53.2	41.2	60.7	42.7	41.0	66.7	44.8	54.9	60.7	33.8	38.3
Incr Delay (d2), s/veh	13.0	134.3	0.3	69.5	0.5	0.6	11.8	0.1	23.5	100.5	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	34.0	2.7	16.4	8.7	6.1	4.5	2.5	13.4	18.9	1.5	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	187.4	41.4	130.2	43.2	41.6	78.5	44.9	78.5	161.2	33.8	38.9
LnGrp LOS	E	F	D	F	D	D	E	D	E	F	C	D
Approach Vol, veh/h		2323			1730			1006			1129	
Approach Delay, s/veh		160.4			75.8			69.7			114.0	
Approach LOS		F			E			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	46.0	15.6	54.8	25.6	50.4	29.5	40.8
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	27.0	42.0	11.0	19.2	19.9	22.8	27.0	34.7
Green Ext Time (p_c), s	0.0	0.0	0.2	1.6	0.7	5.8	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	113.5
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	313	50	20	4	25	124	7	413	8	102	442	131
Future Volume (veh/h)	313	50	20	4	25	124	7	413	8	102	442	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	313	50	20	4	25	124	7	413	8	102	442	131
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	384	613	520	8	219	185	13	1106	21	135	1444	448
Arrive On Green	0.22	0.33	0.33	0.00	0.12	0.12	0.01	0.21	0.21	0.08	0.28	0.28
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5157	100	1781	5106	1585
Grp Volume(v), veh/h	313	50	20	4	25	124	7	272	149	102	442	131
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1852	1781	1702	1585
Q Serve(g_s), s	8.9	1.0	0.5	0.1	0.6	4.0	0.2	3.6	3.6	3.0	3.6	3.4
Cycle Q Clear(g_c), s	8.9	1.0	0.5	0.1	0.6	4.0	0.2	3.6	3.6	3.0	3.6	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	384	613	520	8	219	185	13	730	397	135	1444	448
V/C Ratio(X)	0.82	0.08	0.04	0.52	0.11	0.67	0.53	0.37	0.37	0.76	0.31	0.29
Avail Cap(c_a), veh/h	673	883	748	673	883	748	673	1928	1049	673	2892	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	12.3	12.1	26.3	20.9	22.4	26.2	17.8	17.8	24.0	14.9	14.9
Incr Delay (d2), s/veh	4.3	0.1	0.0	45.3	0.2	4.1	29.4	1.1	2.1	8.4	0.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.4	0.1	0.1	0.3	1.5	0.2	1.3	1.5	1.4	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	12.3	12.1	71.7	21.2	26.6	55.6	18.9	19.9	32.4	15.3	16.2
LnGrp LOS	C	B	B	E	C	C	E	B	B	C	B	B
Approach Vol, veh/h		383			153			428			675	
Approach Delay, s/veh		21.9			26.9			19.9			18.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	22.4	4.9	21.0	15.9	11.2	8.5	17.4
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	3.0	2.2	5.6	10.9	6.0	5.0	5.6
Green Ext Time (p_c), s	0.0	0.3	0.0	7.7	0.7	0.5	0.2	5.7

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	1727	63	172	918	121	58	186	315	261	181	88
Future Volume (veh/h)	62	1727	63	172	918	121	58	186	315	261	181	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	1727	63	172	918	121	58	186	315	261	181	88
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	1822	66	197	1514	675	75	397	336	260	376	183
Arrive On Green	0.04	0.36	0.36	0.11	0.43	0.43	0.04	0.21	0.21	0.15	0.32	0.32
Sat Flow, veh/h	1781	5057	184	1781	3554	1585	1781	1870	1585	1781	1189	578
Grp Volume(v), veh/h	62	1162	628	172	918	121	58	186	315	261	0	269
Grp Sat Flow(s),veh/h/ln	1781	1702	1837	1781	1777	1585	1781	1870	1585	1781	0	1766
Q Serve(g_s), s	4.7	45.4	45.5	13.0	27.4	6.5	4.4	11.9	26.8	20.0	0.0	16.8
Cycle Q Clear(g_c), s	4.7	45.4	45.5	13.0	27.4	6.5	4.4	11.9	26.8	20.0	0.0	16.8
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	80	1226	662	197	1514	675	75	397	336	260	0	558
V/C Ratio(X)	0.77	0.95	0.95	0.87	0.61	0.18	0.77	0.47	0.94	1.00	0.00	0.48
Avail Cap(c_a), veh/h	260	1242	670	260	1514	675	260	409	347	260	0	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	64.7	42.6	42.6	60.0	30.4	24.4	65.0	47.2	53.1	58.5	0.0	37.8
Incr Delay (d2), s/veh	14.5	14.5	22.5	21.3	0.8	0.2	15.2	0.9	31.9	56.8	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	21.2	24.4	6.9	11.5	2.5	2.3	5.6	13.5	13.1	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.3	57.1	65.1	81.2	31.3	24.6	80.2	48.1	85.0	115.3	0.0	38.5
LnGrp LOS	E	E	E	F	C	C	F	D	F	F	A	D
Approach Vol, veh/h		1852			1211			559			530	
Approach Delay, s/veh		60.5			37.7			72.2			76.3	
Approach LOS		E			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.5	55.4	11.4	49.8	11.5	64.4	25.6	35.6
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	15.0	47.5	6.4	18.8	6.7	29.4	22.0	28.8
Green Ext Time (p_c), s	0.2	1.9	0.1	1.1	0.1	8.8	0.0	0.3

Intersection Summary		
HCM 6th Ctrl Delay		57.4
HCM 6th LOS		E

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	0	25	71	173	9	28	50	115	166	49	161	0
Future Vol, veh/h	0	25	71	173	9	28	50	115	166	49	161	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	25	71	173	9	28	50	115	166	49	161	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.2	11.2	11.8	10.7
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	0%	82%	23%
Vol Thru, %	35%	26%	4%	77%
Vol Right, %	50%	74%	13%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	331	96	210	210
LT Vol	50	0	173	49
Through Vol	115	25	9	161
RT Vol	166	71	28	0
Lane Flow Rate	331	96	210	210
Geometry Grp	1	1	1	1
Degree of Util (X)	0.448	0.14	0.324	0.31
Departure Headway (Hd)	4.873	5.247	5.552	5.307
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	745	682	647	676
Service Time	2.873	3.293	3.592	3.343
HCM Lane V/C Ratio	0.444	0.141	0.325	0.311
HCM Control Delay	11.8	9.2	11.2	10.7
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	2.3	0.5	1.4	1.3

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	46	0	3	21	36	0	0	9	41	0	1
Future Vol, veh/h	0	46	0	3	21	36	0	0	9	41	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	46	0	3	21	36	0	0	9	41	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	57	0	0	46	0	0	92	109	46	96	91	39
Stage 1	-	-	-	-	-	-	46	46	-	45	45	-
Stage 2	-	-	-	-	-	-	46	63	-	51	46	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1547	-	-	1562	-	-	892	781	1023	887	799	1033
Stage 1	-	-	-	-	-	-	968	857	-	969	857	-
Stage 2	-	-	-	-	-	-	968	842	-	962	857	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1547	-	-	1562	-	-	890	779	1023	878	797	1033
Mov Cap-2 Maneuver	-	-	-	-	-	-	890	779	-	878	797	-
Stage 1	-	-	-	-	-	-	968	857	-	969	855	-
Stage 2	-	-	-	-	-	-	965	840	-	954	857	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	8.6	9.3
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1023	1547	-	-	1562	-	-	881
HCM Lane V/C Ratio	0.009	-	-	-	0.002	-	-	0.048
HCM Control Delay (s)	8.6	0	-	-	7.3	0	-	9.3
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	0.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	5	17	267	228	5
Future Vol, veh/h	8	5	17	267	228	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	5	17	267	228	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	532	231	233	0	-	0
Stage 1	231	-	-	-	-	-
Stage 2	301	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	508	808	1335	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	500	808	1335	-	-	-
Mov Cap-2 Maneuver	500	-	-	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	751	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1335	-	586	-	-
HCM Lane V/C Ratio	0.013	-	0.022	-	-
HCM Control Delay (s)	7.7	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	3.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	17	47	14	32	17
Future Vol, veh/h	5	17	47	14	32	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	17	47	14	32	17

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	135	54	0	0	61	0
Stage 1	54	-	-	-	-	-
Stage 2	81	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	859	1013	-	-	1542	-
Stage 1	969	-	-	-	-	-
Stage 2	942	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	841	1013	-	-	1542	-
Mov Cap-2 Maneuver	841	-	-	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	922	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	4.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	968	1542	-
HCM Lane V/C Ratio	-	-	0.023	0.021	-
HCM Control Delay (s)	-	-	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	345.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	1523	949	116	330	71
Future Vol, veh/h	25	1523	949	116	330	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	1523	949	116	330	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1065	0	-	0	1819	533
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	812	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	650	-	-	-	~ 69	491
Stage 1	-	-	-	-	~ 314	-
Stage 2	-	-	-	-	397	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	650	-	-	-	~ 52	491
Mov Cap-2 Maneuver	-	-	-	-	~ 52	-
Stage 1	-	-	-	-	~ 236	-
Stage 2	-	-	-	-	397	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	$ 2590.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	650	-	-	-	62
HCM Lane V/C Ratio	0.038	-	-	-	6.468
HCM Control Delay (s)	10.8	1.3	-		$ 2590.4
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	45.7

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	353	1159	0	0	1321	391	488	0	406	0	0	0
Future Volume (veh/h)	353	1159	0	0	1321	391	488	0	406	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	353	1159	0	0	1321	391	488	0	406			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	345	2032	0	0	924	266	312	0	260			
Arrive On Green	0.19	0.57	0.00	0.00	0.34	0.34	0.34	0.00	0.34			
Sat Flow, veh/h	1781	3647	0	0	2817	783	921	0	766			
Grp Volume(v), veh/h	353	1159	0	0	849	863	894	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1729	1686	0	0			
Q Serve(g_s), s	20.0	21.4	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	20.0	21.4	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.45	0.55		0.45			
Lane Grp Cap(c), veh/h	345	2032	0	0	603	587	572	0	0			
V/C Ratio(X)	1.02	0.57	0.00	0.00	1.41	1.47	1.56	0.00	0.00			
Avail Cap(c_a), veh/h	345	2032	0	0	603	587	572	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	41.6	14.0	0.0	0.0	34.1	34.1	34.1	0.0	0.0			
Incr Delay (d2), s/veh	54.3	0.6	0.0	0.0	193.4	221.6	261.8	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	13.8	8.0	0.0	0.0	46.8	50.2	54.9	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	95.9	14.6	0.0	0.0	227.5	255.7	295.9	0.0	0.0			
LnGrp LOS	F	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1512			1712			894				
Approach Delay, s/veh		33.6			241.8			295.9				
Approach LOS		C			F			F				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		63.6			24.0	39.6		39.6				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0				
Max Q Clear Time (g_c+I1), s		23.4			22.0	37.0		37.0				
Green Ext Time (p_c), s		18.2			0.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			177.1
HCM 6th LOS			F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1142	447	412	1397	0	0	0	0	369	5	278
Future Volume (veh/h)	0	1142	447	412	1397	0	0	0	0	369	5	278
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1142	447	412	1397	0				369	5	278
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1224	479	345	1069	0				325	4	245
Arrive On Green	0.00	0.34	0.34	0.19	0.57	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	3777	1411	1781	1870	0				958	13	722
Grp Volume(v), veh/h	0	1077	512	412	1397	0				652	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1616	1781	1870	0				1693	0	0
Q Serve(g_s), s	0.0	31.6	31.6	20.0	59.0	0.0				35.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	31.6	31.6	20.0	59.0	0.0				35.0	0.0	0.0
Prop In Lane	0.00		0.87	1.00		0.00				0.57		0.43
Lane Grp Cap(c), veh/h	0	1154	548	345	1069	0				574	0	0
V/C Ratio(X)	0.00	0.93	0.93	1.19	1.31	0.00				1.14	0.00	0.00
Avail Cap(c_a), veh/h	0	1154	548	345	1069	0				574	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	33.0	33.0	41.6	22.1	0.0				34.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	13.7	23.8	112.1	144.7	0.0				80.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.7	15.5	19.3	65.9	0.0				26.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	46.7	56.8	153.7	166.8	0.0				115.0	0.0	0.0
LnGrp LOS	A	D	E	F	F	A				F	A	A
Approach Vol, veh/h		1589			1809						652	
Approach Delay, s/veh		50.0			163.8						115.0	
Approach LOS		D			F						F	

Timer - Assigned Phs	1	2	4	6
Phs Duration (G+Y+Rc), s	24.0	39.6	39.6	63.6
Change Period (Y+Rc), s	4.0	4.6	4.6	4.6
Max Green Setting (Gmax), s	20.0	35.0	35.0	59.0
Max Q Clear Time (g_c+I1), s	22.0	33.6	37.0	61.0
Green Ext Time (p_c), s	0.0	1.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	111.3
HCM 6th LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	836	1383	0	0	1065	426	887	5	538	0	0	0
Future Volume (veh/h)	836	1383	0	0	1065	426	887	5	538	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	836	1383	0	0	1065	0	887	5	538			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	375	2025	0	0	1120		578	3	517			
Arrive On Green	0.21	0.57	0.00	0.00	0.32	0.00	0.33	0.33	0.33			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1772	10	1585			
Grp Volume(v), veh/h	836	1383	0	0	1065	0	892	0	538			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	20.0	26.1	0.0	0.0	27.9	0.0	31.0	0.0	31.0			
Cycle Q Clear(g_c), s	20.0	26.1	0.0	0.0	27.9	0.0	31.0	0.0	31.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	375	2025	0	0	1120		581	0	517			
V/C Ratio(X)	2.23	0.68	0.00	0.00	0.95		1.54	0.00	1.04			
Avail Cap(c_a), veh/h	375	2026	0	0	1121		581	0	517			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	37.5	14.4	0.0	0.0	31.8	0.0	32.0	0.0	32.0			
Incr Delay (d2), s/veh	562.4	1.1	0.0	0.0	16.5	0.0	249.4	0.0	50.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	66.7	9.1	0.0	0.0	13.6	0.0	52.5	0.0	18.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	600.0	15.5	0.0	0.0	48.4	0.0	281.5	0.0	82.7			
LnGrp LOS	F	B	A	A	D		F	A	F			
Approach Vol, veh/h		2219			1065			1430				
Approach Delay, s/veh		235.7			48.4			206.7				
Approach LOS		F			D			F				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		59.5			24.2	35.3		35.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		28.1			22.0	29.9		33.0				
Green Ext Time (p_c), s		14.8			0.0	0.1		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			184.6
HCM 6th LOS			F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1701	1454	368	1583	0	0	0	0	517	0	586
Future Volume (veh/h)	0	1701	1454	368	1583	0	0	0	0	517	0	586
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1701	1454	368	1583	0				517	0	586
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1281	398	290	873	0				729	0	649
Arrive On Green	0.00	0.25	0.25	0.16	0.47	0.00				0.41	0.00	0.41
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	0	1585
Grp Volume(v), veh/h	0	1701	1454	368	1583	0				517	0	586
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1585
Q Serve(g_s), s	0.0	20.0	20.0	13.0	37.2	0.0				19.3	0.0	27.6
Cycle Q Clear(g_c), s	0.0	20.0	20.0	13.0	37.2	0.0				19.3	0.0	27.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1281	398	290	873	0				729	0	649
V/C Ratio(X)	0.00	1.33	3.66	1.27	1.81	0.00				0.71	0.00	0.90
Avail Cap(c_a), veh/h	0	1281	398	290	873	0				782	0	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	29.9	29.9	33.4	21.3	0.0				19.6	0.0	22.1
Incr Delay (d2), s/veh	0.0	153.1	1201.8	144.6	370.8	0.0				2.9	0.0	14.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	25.6	139.6	16.9	103.4	0.0				7.5	0.0	11.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	183.0	1231.6	178.0	392.1	0.0				22.5	0.0	36.9
LnGrp LOS	A	F	F	F	F	A				C	A	D
Approach Vol, veh/h		3155			1951						1103	
Approach Delay, s/veh		666.2			351.7						30.2	
Approach LOS		F			F						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.2	25.3		37.2		42.5						
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3						
Max Green Setting (Gmax), s	* 13	20.0		35.0		37.2						
Max Q Clear Time (g_c+I1), s	15.0	22.0		29.6		39.2						
Green Ext Time (p_c), s	0.0	0.0		3.0		0.0						

Intersection Summary	
HCM 6th Ctrl Delay	454.4
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	573	94	865	591	450	348	193	430	429	65	54
Future Volume (veh/h)	110	573	94	865	591	450	348	193	430	429	65	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	110	573	94	865	591	450	348	193	430	429	65	54
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	1109	495	413	1254	559	386	391	584	213	398	177
Arrive On Green	0.08	0.31	0.31	0.12	0.35	0.35	0.22	0.21	0.21	0.12	0.11	0.11
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	110	573	94	865	591	450	348	193	430	429	65	54
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	5.1	11.1	3.6	10.0	10.8	21.5	15.9	7.6	12.1	10.0	1.4	2.6
Cycle Q Clear(g_c), s	5.1	11.1	3.6	10.0	10.8	21.5	15.9	7.6	12.1	10.0	1.4	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	140	1109	495	413	1254	559	386	391	584	213	398	177
V/C Ratio(X)	0.79	0.52	0.19	2.10	0.47	0.80	0.90	0.49	0.74	2.02	0.16	0.30
Avail Cap(c_a), veh/h	213	2121	946	413	2121	946	425	1116	1665	213	1697	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.9	23.6	21.1	36.9	21.0	24.5	31.9	29.2	31.0	36.9	33.7	34.2
Incr Delay (d2), s/veh	10.3	0.4	0.2	501.8	0.3	2.8	20.7	1.0	1.8	474.1	0.2	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.5	1.2	32.8	4.3	7.5	8.5	3.2	3.9	32.1	0.6	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	24.0	21.3	538.7	21.3	27.3	52.7	30.2	32.8	510.9	33.8	35.2
LnGrp LOS	D	C	C	F	C	C	D	C	C	F	C	D
Approach Vol, veh/h		777			1906			971			548	
Approach Delay, s/veh		27.1			257.5			39.4			407.5	
Approach LOS		C			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	31.2	22.8	15.2	11.2	34.6	14.6	23.3
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8
Max Green Setting (Gmax), s	10.0	50.0	20.0	* 40	10.0	50.0	10.0	50.0
Max Q Clear Time (g_c+I1), s	12.0	13.1	17.9	4.6	7.1	23.5	12.0	14.1
Green Ext Time (p_c), s	0.0	4.5	0.2	0.5	0.1	6.1	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	184.1
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	17	348	84	29	28	326	830	40	53	581	97
Future Volume (veh/h)	115	17	348	84	29	28	326	830	40	53	581	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	17	348	84	29	28	326	830	40	53	581	97
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	146	21	421	131	234	226	368	1732	83	107	887	146
Arrive On Green	0.08	0.28	0.28	0.07	0.27	0.27	0.21	0.35	0.35	0.06	0.20	0.20
Sat Flow, veh/h	1781	74	1522	1781	874	844	1781	4991	240	1781	4418	726
Grp Volume(v), veh/h	115	0	365	84	0	57	326	565	305	53	446	232
Grp Sat Flow(s),veh/h/ln	1781	0	1596	1781	0	1718	1781	1702	1827	1781	1702	1740
Q Serve(g_s), s	5.1	0.0	17.4	3.7	0.0	2.0	14.4	10.5	10.6	2.3	9.8	10.0
Cycle Q Clear(g_c), s	5.1	0.0	17.4	3.7	0.0	2.0	14.4	10.5	10.6	2.3	9.8	10.0
Prop In Lane	1.00		0.95	1.00		0.49	1.00		0.13	1.00		0.42
Lane Grp Cap(c), veh/h	146	0	441	131	0	460	368	1181	634	107	683	349
V/C Ratio(X)	0.79	0.00	0.83	0.64	0.00	0.12	0.89	0.48	0.48	0.49	0.65	0.67
Avail Cap(c_a), veh/h	220	0	689	220	0	742	439	1469	789	220	1049	536
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	0.0	27.5	36.5	0.0	22.5	31.3	20.7	20.7	36.9	29.8	29.9
Incr Delay (d2), s/veh	10.3	0.0	6.3	5.2	0.0	0.2	17.1	0.4	0.8	3.5	1.5	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	7.2	1.8	0.0	0.8	7.4	3.8	4.1	1.1	3.8	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	0.0	33.8	41.7	0.0	22.7	48.3	21.2	21.6	40.4	31.3	33.0
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	C	C
Approach Vol, veh/h		480			141			1196			731	
Approach Delay, s/veh		36.9			34.0			28.7			32.5	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	27.1	21.3	22.1	11.3	26.4	9.5	33.9
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	5.7	19.4	16.4	12.0	7.1	4.0	4.3	12.6
Green Ext Time (p_c), s	0.1	3.0	0.3	4.3	0.1	0.4	0.0	7.3

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	653	1552	157	982	1886	464	224	309	618	739	256	445
Future Volume (veh/h)	653	1552	157	982	1886	464	224	309	618	739	256	445
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	653	1552	157	982	1886	464	224	309	618	739	256	445
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	592	1400	435	592	1400	435	248	1203	657	592	1367	424
Arrive On Green	0.17	0.27	0.27	0.17	0.27	0.27	0.14	0.24	0.24	0.17	0.27	0.27
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	653	1552	157	982	1886	464	224	309	618	739	256	445
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	25.0	40.0	11.6	25.0	40.0	40.0	18.1	7.2	31.7	25.0	5.6	39.0
Cycle Q Clear(g_c), s	25.0	40.0	11.6	25.0	40.0	40.0	18.1	7.2	31.7	25.0	5.6	39.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	592	1400	435	592	1400	435	248	1203	657	592	1367	424
V/C Ratio(X)	1.10	1.11	0.36	1.66	1.35	1.07	0.90	0.26	0.94	1.25	0.19	1.05
Avail Cap(c_a), veh/h	592	1400	435	592	1400	435	305	1225	669	592	1367	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.4	52.9	42.6	60.4	52.9	52.9	61.8	45.4	54.7	60.4	41.2	53.4
Incr Delay (d2), s/veh	68.2	59.5	0.5	303.6	160.9	62.3	25.0	0.1	21.2	125.1	0.1	57.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.3	24.3	4.6	35.7	37.5	23.0	9.7	3.0	12.8	20.9	2.3	21.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	128.7	112.5	43.1	364.0	213.9	115.2	86.8	45.5	76.0	185.5	41.2	110.5
LnGrp LOS	F	F	D	F	F	F	F	D	E	F	D	F
Approach Vol, veh/h		2362			3332			1151			1440	
Approach Delay, s/veh		112.3			244.4			69.9			136.7	
Approach LOS		F			F			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.0	46.0	24.8	45.0	30.0	46.0	29.5	40.4
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	25.0	40.0	25.0	35.0	25.0	40.0	25.0	35.0
Max Q Clear Time (g_c+I1), s	27.0	42.0	20.1	41.0	27.0	42.0	27.0	33.7
Green Ext Time (p_c), s	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	163.8
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	20	13	4	48	111	1	460	1	160	471	185
Future Volume (veh/h)	170	20	13	4	48	111	1	460	1	160	471	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	170	20	13	4	48	111	1	460	1	160	471	185
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	225	435	369	8	206	175	4	1266	3	212	1830	568
Arrive On Green	0.13	0.23	0.23	0.00	0.11	0.11	0.00	0.24	0.24	0.12	0.36	0.36
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5261	11	1781	5106	1585
Grp Volume(v), veh/h	170	20	13	4	48	111	1	298	163	160	471	185
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1868	1781	1702	1585
Q Serve(g_s), s	4.6	0.4	0.3	0.1	1.2	3.3	0.0	3.6	3.6	4.3	3.2	4.2
Cycle Q Clear(g_c), s	4.6	0.4	0.3	0.1	1.2	3.3	0.0	3.6	3.6	4.3	3.2	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	225	435	369	8	206	175	4	819	450	212	1830	568
V/C Ratio(X)	0.75	0.05	0.04	0.52	0.23	0.63	0.28	0.36	0.36	0.76	0.26	0.33
Avail Cap(c_a), veh/h	719	944	800	719	944	800	719	2061	1131	719	3091	960
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	14.8	14.7	24.6	20.1	21.1	24.7	15.7	15.7	21.1	11.2	11.5
Incr Delay (d2), s/veh	5.1	0.0	0.0	45.1	0.6	3.8	37.4	1.0	1.8	5.4	0.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.2	0.1	0.1	0.5	1.2	0.0	1.2	1.5	1.8	1.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.0	14.8	14.8	69.7	20.7	24.9	62.1	16.6	17.4	26.5	11.5	12.7
LnGrp LOS	C	B	B	E	C	C	E	B	B	C	B	B
Approach Vol, veh/h		203			163			462			816	
Approach Delay, s/veh		24.2			24.7			17.0			14.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	16.5	4.6	23.8	10.8	10.5	10.4	17.9
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	2.4	2.0	6.2	6.6	5.3	6.3	5.6
Green Ext Time (p_c), s	0.0	0.1	0.0	8.7	0.4	0.5	0.3	6.3

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1853	87	298	1977	280	30	46	285	218	48	36
Future Volume (veh/h)	83	1853	87	298	1977	280	30	46	285	218	48	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	83	1853	87	298	1977	280	30	46	285	218	48	36
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	1794	84	256	1577	703	44	363	307	241	302	227
Arrive On Green	0.06	0.36	0.36	0.14	0.44	0.44	0.02	0.19	0.19	0.14	0.30	0.30
Sat Flow, veh/h	1781	4998	234	1781	3554	1585	1781	1870	1585	1781	992	744
Grp Volume(v), veh/h	83	1261	679	298	1977	280	30	46	285	218	0	84
Grp Sat Flow(s),veh/h/ln	1781	1702	1828	1781	1777	1585	1781	1870	1585	1781	0	1736
Q Serve(g_s), s	6.4	50.0	50.0	20.0	61.8	16.6	2.3	2.8	24.6	16.8	0.0	4.9
Cycle Q Clear(g_c), s	6.4	50.0	50.0	20.0	61.8	16.6	2.3	2.8	24.6	16.8	0.0	4.9
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	105	1222	656	256	1577	703	44	363	307	241	0	529
V/C Ratio(X)	0.79	1.03	1.03	1.17	1.25	0.40	0.68	0.13	0.93	0.90	0.00	0.16
Avail Cap(c_a), veh/h	256	1222	656	256	1577	703	256	403	341	256	0	529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	64.7	44.6	44.6	59.6	38.7	26.2	67.4	46.4	55.2	59.3	0.0	35.4
Incr Delay (d2), s/veh	12.6	34.3	44.3	108.3	119.5	0.5	17.1	0.2	29.2	31.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	26.5	30.3	16.5	51.6	6.4	1.3	1.3	12.2	9.6	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.3	79.0	89.0	168.0	158.2	26.7	84.4	46.5	84.3	90.6	0.0	35.5
LnGrp LOS	E	F	F	F	F	C	F	D	F	F	A	D
Approach Vol, veh/h		2023			2555			361			302	
Approach Delay, s/veh		82.3			144.9			79.5			75.2	
Approach LOS		F			F			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.3	56.0	9.0	48.9	13.5	67.8	24.5	33.5				
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	5.6	6.5				
Max Green Setting (Gmax), s	20.0	50.0	20.0	30.0	20.0	50.0	20.0	30.0				
Max Q Clear Time (g_c+I1), s	22.0	52.0	4.3	6.9	8.4	63.8	18.8	26.6				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.4	0.1	0.0	0.1	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			112.2									
HCM 6th LOS			F									

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	21	59	152	38	37	49	84	117	33	53	0
Future Vol, veh/h	0	21	59	152	38	37	49	84	117	33	53	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	21	59	152	38	37	49	84	117	33	53	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	10.1	9.7	8.8
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	0%	67%	38%
Vol Thru, %	34%	26%	17%	62%
Vol Right, %	47%	74%	16%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	80	227	86
LT Vol	49	0	152	33
Through Vol	84	21	38	53
RT Vol	117	59	37	0
Lane Flow Rate	250	80	227	86
Geometry Grp	1	1	1	1
Degree of Util (X)	0.316	0.102	0.306	0.121
Departure Headway (Hd)	4.544	4.573	4.852	5.056
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	788	777	738	704
Service Time	2.595	2.642	2.909	3.119
HCM Lane V/C Ratio	0.317	0.103	0.308	0.122
HCM Control Delay	9.7	8.2	10.1	8.8
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	1.4	0.3	1.3	0.4

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	42	0	11	31	34	0	0	6	36	0	4
Future Vol, veh/h	0	42	0	11	31	34	0	0	6	36	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	42	0	11	31	34	0	0	6	36	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	65	0	0	42	0	0	114	129	42	115	112	48
Stage 1	-	-	-	-	-	-	42	42	-	70	70	-
Stage 2	-	-	-	-	-	-	72	87	-	45	42	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1537	-	-	1567	-	-	863	762	1029	862	778	1021
Stage 1	-	-	-	-	-	-	972	860	-	940	837	-
Stage 2	-	-	-	-	-	-	938	823	-	969	860	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1537	-	-	1567	-	-	855	757	1029	853	773	1021
Mov Cap-2 Maneuver	-	-	-	-	-	-	855	757	-	853	773	-
Stage 1	-	-	-	-	-	-	972	860	-	940	831	-
Stage 2	-	-	-	-	-	-	928	817	-	963	860	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.1	8.5	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1029	1537	-	-	1567	-	-	867
HCM Lane V/C Ratio	0.006	-	-	-	0.007	-	-	0.046
HCM Control Delay (s)	8.5	0	-	-	7.3	0	-	9.4
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	0.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	12	16	203	253	7
Future Vol, veh/h	12	12	16	203	253	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	12	16	203	253	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	492	257	260	0	-	0
Stage 1	257	-	-	-	-	-
Stage 2	235	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	536	782	1304	-	-	-
Stage 1	786	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	528	782	1304	-	-	-
Mov Cap-2 Maneuver	528	-	-	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	804	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1304	-	630	-	-
HCM Lane V/C Ratio	0.012	-	0.038	-	-
HCM Control Delay (s)	7.8	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	3.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	18	32	10	32	54
Future Vol, veh/h	16	18	32	10	32	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	18	32	10	32	54

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	155	37	0	0	42	0
Stage 1	37	-	-	-	-	-
Stage 2	118	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	836	1035	-	-	1567	-
Stage 1	985	-	-	-	-	-
Stage 2	907	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	818	1035	-	-	1567	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	2.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	920	1567	-
HCM Lane V/C Ratio	-	-	0.037	0.02	-
HCM Control Delay (s)	-	-	9.1	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	563.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	81	1801	1665	378	222	48
Future Vol, veh/h	81	1801	1665	378	222	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	81	1801	1665	378	222	48

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2043	0	-	0	2917	1022
Stage 1	-	-	-	-	1854	-
Stage 2	-	-	-	-	1063	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	272	-	-	-	~ 12	233
Stage 1	-	-	-	-	~ 109	-
Stage 2	-	-	-	-	293	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	272	-	-	-	~ 12	233
Mov Cap-2 Maneuver	-	-	-	-	~ 12	-
Stage 1	-	-	-	-	~ 109	-
Stage 2	-	-	-	-	293	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	$ 8753.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	272	-	-	-	14
HCM Lane V/C Ratio	0.298	-	-	-	19.286
HCM Control Delay (s)	23.8	0	-	$	8753.5
HCM Lane LOS	C	A	-	-	F
HCM 95th %tile Q(veh)	1.2	-	-	-	34.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	363	1399	0	0	1397	363	482	7	559	0	0	0
Future Volume (veh/h)	363	1399	0	0	1397	363	482	7	559	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	363	1399	0	0	1397	363	482	7	559			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	345	2032	0	0	953	241	261	4	302			
Arrive On Green	0.19	0.57	0.00	0.00	0.34	0.34	0.34	0.34	0.34			
Sat Flow, veh/h	1781	3647	0	0	2903	710	769	11	892			
Grp Volume(v), veh/h	363	1399	0	0	868	892	1048	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1743	1671	0	0			
Q Serve(g_s), s	20.0	28.7	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Cycle Q Clear(g_c), s	20.0	28.7	0.0	0.0	35.0	35.0	35.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.41	0.46		0.53			
Lane Grp Cap(c), veh/h	345	2032	0	0	603	591	567	0	0			
V/C Ratio(X)	1.05	0.69	0.00	0.00	1.44	1.51	1.85	0.00	0.00			
Avail Cap(c_a), veh/h	345	2032	0	0	603	591	567	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	41.6	15.6	0.0	0.0	34.1	34.1	34.1	0.0	0.0			
Incr Delay (d2), s/veh	62.6	1.2	0.0	0.0	207.8	237.5	388.7	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	14.6	10.9	0.0	0.0	49.2	53.1	74.4	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	104.2	16.9	0.0	0.0	241.9	271.6	422.8	0.0	0.0			
LnGrp LOS	F	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1762			1760			1048				
Approach Delay, s/veh		34.8			257.0			422.8				
Approach LOS		C			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		63.6			24.0	39.6		39.6				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		59.0			20.0	35.0		35.0				
Max Q Clear Time (g_c+I1), s		30.7			22.0	37.0		37.0				
Green Ext Time (p_c), s		19.4			0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			209.4									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1296	540	379	1500	0	0	0	0	466	11	406
Future Volume (veh/h)	0	1296	540	379	1500	0	0	0	0	466	11	406
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1296	540	379	1500	0				466	11	406
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1203	497	345	1069	0				302	7	263
Arrive On Green	0.00	0.34	0.34	0.19	0.57	0.00				0.34	0.34	0.34
Sat Flow, veh/h	0	3715	1464	1781	1870	0				890	21	775
Grp Volume(v), veh/h	0	1243	593	379	1500	0				883	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1607	1781	1870	0				1686	0	0
Q Serve(g_s), s	0.0	35.0	35.0	20.0	59.0	0.0				35.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	35.0	35.0	20.0	59.0	0.0				35.0	0.0	0.0
Prop In Lane	0.00		0.91	1.00		0.00				0.53		0.46
Lane Grp Cap(c), veh/h	0	1154	545	345	1069	0				572	0	0
V/C Ratio(X)	0.00	1.08	1.09	1.10	1.40	0.00				1.54	0.00	0.00
Avail Cap(c_a), veh/h	0	1154	545	345	1069	0				572	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	34.1	34.1	41.6	22.1	0.0				34.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	49.9	64.4	77.3	186.9	0.0				253.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	21.8	22.8	16.0	78.4	0.0				53.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	84.0	98.5	118.9	209.0	0.0				287.5	0.0	0.0
LnGrp LOS	A	F	F	F	F	A				F	A	A
Approach Vol, veh/h		1836			1879						883	
Approach Delay, s/veh		88.6			190.9						287.5	
Approach LOS		F			F						F	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	24.0	39.6		39.6		63.6
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6
Max Green Setting (Gmax), s	20.0	35.0		35.0		59.0
Max Q Clear Time (g_c+I1), s	22.0	37.0		37.0		61.0
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0

Intersection Summary			
HCM 6th Ctrl Delay			168.6
HCM 6th LOS			F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	667	1594	0	0	1540	748	1579	8	619	0	0	0
Future Volume (veh/h)	667	1594	0	0	1540	748	1579	8	619	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	667	1594	0	0	1540	0	1579	8	619			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	375	2025	0	0	1121		578	3	517			
Arrive On Green	0.21	0.57	0.00	0.00	0.32	0.00	0.33	0.33	0.33			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1773	9	1585			
Grp Volume(v), veh/h	667	1594	0	0	1540	0	1587	0	619			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	20.0	33.3	0.0	0.0	30.0	0.0	31.0	0.0	31.0			
Cycle Q Clear(g_c), s	20.0	33.3	0.0	0.0	30.0	0.0	31.0	0.0	31.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	375	2025	0	0	1121		581	0	517			
V/C Ratio(X)	1.78	0.79	0.00	0.00	1.37		2.73	0.00	1.20			
Avail Cap(c_a), veh/h	375	2025	0	0	1121		581	0	517			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	37.5	15.9	0.0	0.0	32.5	0.0	32.1	0.0	32.0			
Incr Delay (d2), s/veh	361.9	2.3	0.0	0.0	173.9	0.0	784.5	0.0	106.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	45.8	11.9	0.0	0.0	39.0	0.0	138.8	0.0	26.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	399.4	18.2	0.0	0.0	206.4	0.0	816.5	0.0	138.8			
LnGrp LOS	F	B	A	A	F		F	A	F			
Approach Vol, veh/h		2261			1540			2206				
Approach Delay, s/veh		130.7			206.4			626.3				
Approach LOS		F			F			F				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		59.5			24.2	35.3		35.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		35.3			22.0	32.0		33.0				
Green Ext Time (p_c), s		13.7			0.0	0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	332.1
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1783	1265	396	2724	0	0	0	0	479	0	817
Future Volume (veh/h)	0	1783	1265	396	2724	0	0	0	0	479	0	817
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1783	1265	396	2724	0				479	0	817
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1244	386	282	847	0				759	0	676
Arrive On Green	0.00	0.24	0.24	0.16	0.45	0.00				0.43	0.00	0.43
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	0	1585
Grp Volume(v), veh/h	0	1783	1265	396	2724	0				479	0	817
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1585
Q Serve(g_s), s	0.0	20.0	20.0	13.0	37.2	0.0				17.3	0.0	35.0
Cycle Q Clear(g_c), s	0.0	20.0	20.0	13.0	37.2	0.0				17.3	0.0	35.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1244	386	282	847	0				759	0	676
V/C Ratio(X)	0.00	1.43	3.28	1.40	3.21	0.00				0.63	0.00	1.21
Avail Cap(c_a), veh/h	0	1244	386	282	847	0				759	0	676
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.1	31.0	34.5	22.4	0.0				18.5	0.0	23.6
Incr Delay (d2), s/veh	0.0	199.7	1030.9	201.8	999.5	0.0				1.8	0.0	107.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	30.5	117.6	21.0	249.1	0.0				6.6	0.0	31.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	230.8	1062.0	236.3	1021.9	0.0				20.3	0.0	131.1
LnGrp LOS	A	F	F	F	F	A				C	A	F
Approach Vol, veh/h		3048			3120						1296	
Approach Delay, s/veh		575.7			922.2						90.2	
Approach LOS		F			F						F	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	17.2	25.3		39.6		42.5
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3
Max Green Setting (Gmax), s	* 13	20.0		35.0		37.2
Max Q Clear Time (g_c+I1), s	15.0	22.0		37.0		39.2
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	636.3
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	814	86	627	529	496	350	62	388	169	38	28
Future Volume (veh/h)	67	814	86	627	529	496	350	62	388	169	38	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	67	814	86	627	529	496	350	62	388	169	38	28
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	111	1059	472	649	1506	672	373	341	508	205	313	140
Arrive On Green	0.06	0.30	0.30	0.19	0.42	0.42	0.21	0.18	0.18	0.12	0.09	0.09
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	67	814	86	627	529	496	350	62	388	169	38	28
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	3.4	19.3	3.7	16.7	9.3	24.3	17.9	2.6	12.2	8.6	0.9	1.5
Cycle Q Clear(g_c), s	3.4	19.3	3.7	16.7	9.3	24.3	17.9	2.6	12.2	8.6	0.9	1.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	111	1059	472	649	1506	672	373	341	508	205	313	140
V/C Ratio(X)	0.61	0.77	0.18	0.97	0.35	0.74	0.94	0.18	0.76	0.82	0.12	0.20
Avail Cap(c_a), veh/h	219	1798	802	649	2028	905	373	791	1180	334	1472	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	29.6	24.1	37.4	18.1	22.4	36.1	32.1	36.0	40.1	39.0	39.2
Incr Delay (d2), s/veh	5.3	1.2	0.2	27.1	0.1	2.2	31.3	0.3	2.4	8.3	0.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	8.1	1.3	9.3	3.7	8.4	10.5	1.1	4.1	4.2	0.4	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.6	30.8	24.3	64.5	18.2	24.6	67.4	32.3	38.4	48.3	39.1	39.9
LnGrp LOS	D	C	C	E	B	C	E	C	D	D	D	D
Approach Vol, veh/h		967			1652			800			235	
Approach Delay, s/veh		31.4			37.7			50.6			45.9	
Approach LOS		C			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.0	32.7	24.0	14.0	10.4	44.4	15.3	22.7				
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8				
Max Green Setting (Gmax), s	17.4	46.9	19.4	* 38	11.4	52.9	17.4	39.2				
Max Q Clear Time (g_c+I1), s	18.7	21.3	19.9	3.5	5.4	26.3	10.6	14.2				
Green Ext Time (p_c), s	0.0	6.3	0.0	0.3	0.1	5.8	0.2	1.8				

Intersection Summary		
HCM 6th Ctrl Delay		39.4
HCM 6th LOS		D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	4	412	28	3	12	152	705	7	28	380	71
Future Volume (veh/h)	151	4	412	28	3	12	152	705	7	28	380	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	151	4	412	28	3	12	152	705	7	28	380	71
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	5	526	77	88	353	198	1309	13	77	796	145
Arrive On Green	0.11	0.33	0.33	0.04	0.27	0.27	0.11	0.25	0.25	0.04	0.18	0.18
Sat Flow, veh/h	1781	15	1572	1781	327	1308	1781	5213	52	1781	4344	789
Grp Volume(v), veh/h	151	0	416	28	0	15	152	460	252	28	295	156
Grp Sat Flow(s),veh/h/ln	1781	0	1587	1781	0	1635	1781	1702	1861	1781	1702	1728
Q Serve(g_s), s	5.0	0.0	14.2	0.9	0.0	0.4	5.0	7.0	7.1	0.9	4.7	4.9
Cycle Q Clear(g_c), s	5.0	0.0	14.2	0.9	0.0	0.4	5.0	7.0	7.1	0.9	4.7	4.9
Prop In Lane	1.00		0.99	1.00		0.80	1.00		0.03	1.00		0.46
Lane Grp Cap(c), veh/h	193	0	531	77	0	441	198	855	467	77	624	317
V/C Ratio(X)	0.78	0.00	0.78	0.36	0.00	0.03	0.77	0.54	0.54	0.36	0.47	0.49
Avail Cap(c_a), veh/h	296	0	924	296	0	951	592	1981	1083	296	1415	718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	18.1	28.0	0.0	16.2	26.0	19.5	19.5	28.0	22.0	22.1
Incr Delay (d2), s/veh	7.3	0.0	3.6	2.8	0.0	0.0	6.1	0.8	1.4	2.8	0.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	5.3	0.4	0.0	0.2	2.2	2.4	2.7	0.4	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.4	0.0	21.7	30.8	0.0	16.2	32.1	20.3	20.9	30.8	22.8	23.7
LnGrp LOS	C	A	C	C	A	B	C	C	C	C	C	C
Approach Vol, veh/h		567			43			864			479	
Approach Delay, s/veh		24.8			25.7			22.5			23.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	24.8	11.3	16.8	11.1	20.9	7.2	20.9
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0
Max Q Clear Time (g_c+I1), s	2.9	16.2	7.0	6.9	7.0	2.4	2.9	9.1
Green Ext Time (p_c), s	0.0	3.9	0.3	3.2	0.1	0.1	0.0	6.1

Intersection Summary	
HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	430	1795	98	653	865	212	111	263	632	701	190	238
Future Volume (veh/h)	430	1795	98	653	865	212	111	263	632	701	190	238
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	430	1795	98	653	865	212	111	263	632	701	190	238
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	1548	480	718	1889	586	135	844	1041	607	1355	644
Arrive On Green	0.14	0.30	0.30	0.21	0.37	0.37	0.08	0.17	0.17	0.18	0.27	0.27
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	430	1795	98	653	865	212	111	263	632	701	190	238
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	17.7	44.0	6.7	26.8	18.7	14.1	8.9	6.6	24.0	25.5	4.1	15.2
Cycle Q Clear(g_c), s	17.7	44.0	6.7	26.8	18.7	14.1	8.9	6.6	24.0	25.5	4.1	15.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	487	1548	480	718	1889	586	135	844	1041	607	1355	644
V/C Ratio(X)	0.88	1.16	0.20	0.91	0.46	0.36	0.82	0.31	0.61	1.15	0.14	0.37
Avail Cap(c_a), veh/h	595	1548	480	833	1899	590	276	844	1041	607	1355	644
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.2	50.6	37.6	56.2	34.7	33.3	66.2	53.3	36.9	59.8	40.7	30.1
Incr Delay (d2), s/veh	12.6	79.6	0.2	12.7	0.2	0.4	11.8	0.2	1.0	87.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	29.6	2.6	12.7	7.6	5.4	4.4	2.8	9.0	18.2	1.7	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.8	130.2	37.8	68.8	34.9	33.6	78.0	53.5	37.9	147.2	40.7	30.4
LnGrp LOS	E	F	D	E	C	C	E	D	D	F	D	C
Approach Vol, veh/h		2323			1730			1006			1129	
Approach Delay, s/veh		115.8			47.5			46.4			104.6	
Approach LOS		F			D			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.2	50.0	15.5	44.5	25.5	59.7	30.0	30.0
Change Period (Y+Rc), s	5.0	6.0	4.5	6.0	5.0	6.0	4.5	6.0
Max Green Setting (Gmax), s	35.0	44.0	22.5	27.0	25.0	54.0	25.5	24.0
Max Q Clear Time (g_c+I1), s	28.8	46.0	10.9	17.2	19.7	20.7	27.5	26.0
Green Ext Time (p_c), s	1.4	0.0	0.2	1.3	0.7	7.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	83.4
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	313	50	20	4	25	124	7	413	8	102	442	131
Future Volume (veh/h)	313	50	20	4	25	124	7	413	8	102	442	131
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	313	50	20	4	25	124	7	413	8	102	442	131
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	384	613	520	8	219	185	13	1106	21	135	1444	448
Arrive On Green	0.22	0.33	0.33	0.00	0.12	0.12	0.01	0.21	0.21	0.08	0.28	0.28
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5157	100	1781	5106	1585
Grp Volume(v), veh/h	313	50	20	4	25	124	7	272	149	102	442	131
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1852	1781	1702	1585
Q Serve(g_s), s	8.9	1.0	0.5	0.1	0.6	4.0	0.2	3.6	3.6	3.0	3.6	3.4
Cycle Q Clear(g_c), s	8.9	1.0	0.5	0.1	0.6	4.0	0.2	3.6	3.6	3.0	3.6	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	384	613	520	8	219	185	13	730	397	135	1444	448
V/C Ratio(X)	0.82	0.08	0.04	0.52	0.11	0.67	0.53	0.37	0.37	0.76	0.31	0.29
Avail Cap(c_a), veh/h	673	883	748	673	883	748	673	1928	1049	673	2892	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8	12.3	12.1	26.3	20.9	22.4	26.2	17.8	17.8	24.0	14.9	14.9
Incr Delay (d2), s/veh	4.3	0.1	0.0	45.3	0.2	4.1	29.4	1.1	2.1	8.4	0.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.4	0.1	0.1	0.3	1.5	0.2	1.3	1.5	1.4	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	12.3	12.1	71.7	21.2	26.6	55.6	18.9	19.9	32.4	15.3	16.2
LnGrp LOS	C	B	B	E	C	C	E	B	B	C	B	B
Approach Vol, veh/h		383			153			428			675	
Approach Delay, s/veh		21.9			26.9			19.9			18.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	22.4	4.9	21.0	15.9	11.2	8.5	17.4
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	3.0	2.2	5.6	10.9	6.0	5.0	5.6
Green Ext Time (p_c), s	0.0	0.3	0.0	7.7	0.7	0.5	0.2	5.7

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	1727	63	172	918	121	58	186	315	261	181	88
Future Volume (veh/h)	62	1727	63	172	918	121	58	186	315	261	181	88
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	1727	63	172	918	121	58	186	315	261	181	88
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	1992	73	202	1644	733	75	269	407	259	303	147
Arrive On Green	0.04	0.39	0.39	0.11	0.46	0.46	0.04	0.14	0.14	0.15	0.25	0.25
Sat Flow, veh/h	1781	5057	184	1781	3554	1585	1781	1870	1585	1781	1189	578
Grp Volume(v), veh/h	62	1162	628	172	918	121	58	186	315	261	0	269
Grp Sat Flow(s),veh/h/ln	1781	1702	1837	1781	1777	1585	1781	1870	1585	1781	0	1766
Q Serve(g_s), s	4.1	37.5	37.6	11.3	22.4	2.8	3.9	11.3	13.2	17.4	0.0	16.0
Cycle Q Clear(g_c), s	4.1	37.5	37.6	11.3	22.4	2.8	3.9	11.3	13.2	17.4	0.0	16.0
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	80	1341	724	202	1644	733	75	269	407	259	0	450
V/C Ratio(X)	0.78	0.87	0.87	0.85	0.56	0.17	0.78	0.69	0.77	1.01	0.00	0.60
Avail Cap(c_a), veh/h	100	1539	831	324	2053	916	95	525	624	259	0	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.5	33.3	33.3	52.0	23.3	5.3	56.7	48.6	17.7	51.0	0.0	39.1
Incr Delay (d2), s/veh	25.7	4.5	7.9	11.6	0.4	0.1	25.8	3.2	3.3	57.4	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	15.8	17.8	5.6	8.9	1.9	2.3	5.5	4.9	11.8	0.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.1	37.8	41.2	63.6	23.7	5.5	82.5	51.8	21.0	108.4	0.0	40.4
LnGrp LOS	F	D	D	E	C	A	F	D	C	F	A	D
Approach Vol, veh/h		1852			1211			559			530	
Approach Delay, s/veh		40.4			27.5			37.6			73.9	
Approach LOS		D			C			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.8	53.1	10.6	37.0	10.6	61.3	23.9	23.7
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	6.5	* 6.5
Max Green Setting (Gmax), s	21.7	54.0	6.4	44.5	6.7	69.0	17.4	* 34
Max Q Clear Time (g_c+I1), s	13.3	39.6	5.9	18.0	6.1	24.4	19.4	15.2
Green Ext Time (p_c), s	0.3	7.5	0.0	1.6	0.0	11.6	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	40.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	0	25	71	173	9	28	50	115	166	49	161	0
Future Vol, veh/h	0	25	71	173	9	28	50	115	166	49	161	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	25	71	173	9	28	50	115	166	49	161	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.2	11.2	11.8	10.7
HCM LOS	A	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	0%	82%	23%
Vol Thru, %	35%	26%	4%	77%
Vol Right, %	50%	74%	13%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	331	96	210	210
LT Vol	50	0	173	49
Through Vol	115	25	9	161
RT Vol	166	71	28	0
Lane Flow Rate	331	96	210	210
Geometry Grp	1	1	1	1
Degree of Util (X)	0.448	0.14	0.324	0.31
Departure Headway (Hd)	4.873	5.247	5.552	5.307
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	745	682	647	676
Service Time	2.873	3.293	3.592	3.343
HCM Lane V/C Ratio	0.444	0.141	0.325	0.311
HCM Control Delay	11.8	9.2	11.2	10.7
HCM Lane LOS	B	A	B	B
HCM 95th-tile Q	2.3	0.5	1.4	1.3

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	46	0	3	21	36	0	0	9	41	0	1
Future Vol, veh/h	0	46	0	3	21	36	0	0	9	41	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	46	0	3	21	36	0	0	9	41	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	57	0	0	46	0	0	92	109	46	96	91	39
Stage 1	-	-	-	-	-	-	46	46	-	45	45	-
Stage 2	-	-	-	-	-	-	46	63	-	51	46	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1547	-	-	1562	-	-	892	781	1023	887	799	1033
Stage 1	-	-	-	-	-	-	968	857	-	969	857	-
Stage 2	-	-	-	-	-	-	968	842	-	962	857	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1547	-	-	1562	-	-	890	779	1023	878	797	1033
Mov Cap-2 Maneuver	-	-	-	-	-	-	890	779	-	878	797	-
Stage 1	-	-	-	-	-	-	968	857	-	969	855	-
Stage 2	-	-	-	-	-	-	965	840	-	954	857	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	8.6	9.3
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1023	1547	-	-	1562	-	-	881
HCM Lane V/C Ratio	0.009	-	-	-	0.002	-	-	0.048
HCM Control Delay (s)	8.6	0	-	-	7.3	0	-	9.3
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	0.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	5	17	267	228	5
Future Vol, veh/h	8	5	17	267	228	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	5	17	267	228	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	532	231	233	0	-	0
Stage 1	231	-	-	-	-	-
Stage 2	301	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	508	808	1335	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	500	808	1335	-	-	-
Mov Cap-2 Maneuver	500	-	-	-	-	-
Stage 1	795	-	-	-	-	-
Stage 2	751	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1335	-	586	-	-
HCM Lane V/C Ratio	0.013	-	0.022	-	-
HCM Control Delay (s)	7.7	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	3.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	17	47	14	32	17
Future Vol, veh/h	5	17	47	14	32	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	17	47	14	32	17

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	135	54	0	0	61	0
Stage 1	54	-	-	-	-	-
Stage 2	81	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	859	1013	-	-	1542	-
Stage 1	969	-	-	-	-	-
Stage 2	942	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	841	1013	-	-	1542	-
Mov Cap-2 Maneuver	841	-	-	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	922	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	4.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	968	1542	-
HCM Lane V/C Ratio	-	-	0.023	0.021	-
HCM Control Delay (s)	-	-	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	1523	949	116	330	71
Future Volume (veh/h)	25	1523	949	116	330	71
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	1523	949	116	330	71
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	50	2190	1624	199	404	359
Arrive On Green	0.03	0.62	0.51	0.51	0.23	0.23
Sat Flow, veh/h	1781	3647	3281	390	1781	1585
Grp Volume(v), veh/h	25	1523	529	536	330	71
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1800	1781	1585
Q Serve(g_s), s	0.9	18.3	13.2	13.2	11.2	2.3
Cycle Q Clear(g_c), s	0.9	18.3	13.2	13.2	11.2	2.3
Prop In Lane	1.00			0.22	1.00	1.00
Lane Grp Cap(c), veh/h	50	2190	905	917	404	359
V/C Ratio(X)	0.50	0.70	0.58	0.58	0.82	0.20
Avail Cap(c_a), veh/h	420	5025	1954	1980	980	872
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.5	8.2	10.9	10.9	23.4	19.9
Incr Delay (d2), s/veh	7.5	0.4	0.6	0.6	4.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.0	4.4	4.4	4.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	38.0	8.6	11.5	11.5	27.5	20.2
LnGrp LOS	D	A	B	B	C	C
Approach Vol, veh/h		1548	1065		401	
Approach Delay, s/veh		9.1	11.5		26.2	
Approach LOS		A	B		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.2		19.4	6.8	37.4
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		90.0		35.0	15.0	70.0
Max Q Clear Time (g_c+I1), s		20.3		13.2	2.9	15.2
Green Ext Time (p_c), s		18.9		1.2	0.0	8.7

Intersection Summary			
HCM 6th Ctrl Delay			12.2
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	353	1159	0	0	1321	391	488	0	406	0	0	0
Future Volume (veh/h)	353	1159	0	0	1321	391	488	0	406	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	353	1159	0	0	1321	391	488	0	406			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	341	2127	0	0	1029	296	307	0	256			
Arrive On Green	0.19	0.60	0.00	0.00	0.38	0.38	0.33	0.00	0.33			
Sat Flow, veh/h	1781	3647	0	0	2817	783	921	0	766			
Grp Volume(v), veh/h	353	1159	0	0	849	863	894	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1729	1686	0	0			
Q Serve(g_s), s	26.0	26.4	0.0	0.0	51.4	51.4	45.4	0.0	0.0			
Cycle Q Clear(g_c), s	26.0	26.4	0.0	0.0	51.4	51.4	45.4	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.45	0.55		0.45			
Lane Grp Cap(c), veh/h	341	2127	0	0	672	654	563	0	0			
V/C Ratio(X)	1.04	0.54	0.00	0.00	1.26	1.32	1.59	0.00	0.00			
Avail Cap(c_a), veh/h	341	2232	0	0	672	654	563	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	55.0	16.3	0.0	0.0	42.3	42.3	45.3	0.0	0.0			
Incr Delay (d2), s/veh	58.6	0.4	0.0	0.0	130.3	155.0	273.0	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	17.1	10.5	0.0	0.0	46.3	49.6	60.9	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	113.6	16.7	0.0	0.0	172.6	197.3	318.3	0.0	0.0			
LnGrp LOS	F	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1512			1712			894				
Approach Delay, s/veh		39.3			185.1			318.3				
Approach LOS		D			F			F				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		86.0			30.0	56.0		50.0				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		85.4			26.0	51.4		45.4				
Max Q Clear Time (g_c+I1), s		28.4			28.0	53.4		47.4				
Green Ext Time (p_c), s		22.4			0.0	0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		160.5
HCM 6th LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1142	447	412	1397	0	0	0	0	369	5	278
Future Volume (veh/h)	0	1142	447	412	1397	0	0	0	0	369	5	278
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1142	447	412	1397	0				369	5	278
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1428	558	331	1141	0				311	4	234
Arrive On Green	0.00	0.40	0.40	0.19	0.61	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3777	1411	1781	1870	0				958	13	722
Grp Volume(v), veh/h	0	1077	512	412	1397	0				652	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1616	1781	1870	0				1693	0	0
Q Serve(g_s), s	0.0	39.2	39.2	26.0	85.4	0.0				45.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	39.2	39.2	26.0	85.4	0.0				45.4	0.0	0.0
Prop In Lane	0.00		0.87	1.00		0.00				0.57		0.43
Lane Grp Cap(c), veh/h	0	1347	640	331	1141	0				549	0	0
V/C Ratio(X)	0.00	0.80	0.80	1.25	1.22	0.00				1.19	0.00	0.00
Avail Cap(c_a), veh/h	0	1347	640	331	1141	0				549	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	37.4	37.4	57.0	27.3	0.0				47.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.9	8.0	133.3	109.0	0.0				101.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.8	16.7	23.8	69.8	0.0				34.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	41.3	45.4	190.3	136.3	0.0				149.1	0.0	0.0
LnGrp LOS	A	D	D	F	F	A				F	A	A
Approach Vol, veh/h		1589			1809						652	
Approach Delay, s/veh		42.6			148.6						149.1	
Approach LOS		D			F						F	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.0	60.0		50.0		90.0						
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6						
Max Green Setting (Gmax), s	26.0	51.4		45.4		85.4						
Max Q Clear Time (g_c+I1), s	28.0	41.2		47.4		87.4						
Green Ext Time (p_c), s	0.0	8.7		0.0		0.0						

Intersection Summary		
HCM 6th Ctrl Delay		107.1
HCM 6th LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	836	1383	0	0	1065	426	887	5	538	0	0	0
Future Volume (veh/h)	836	1383	0	0	1065	426	887	5	538	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	836	1383	0	0	1065	0	887	5	538			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	375	2025	0	0	1120		578	3	517			
Arrive On Green	0.21	0.57	0.00	0.00	0.32	0.00	0.33	0.33	0.33			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1772	10	1585			
Grp Volume(v), veh/h	836	1383	0	0	1065	0	892	0	538			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	20.0	26.1	0.0	0.0	27.9	0.0	31.0	0.0	31.0			
Cycle Q Clear(g_c), s	20.0	26.1	0.0	0.0	27.9	0.0	31.0	0.0	31.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	375	2025	0	0	1120		581	0	517			
V/C Ratio(X)	2.23	0.68	0.00	0.00	0.95		1.54	0.00	1.04			
Avail Cap(c_a), veh/h	375	2026	0	0	1121		581	0	517			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	37.5	14.4	0.0	0.0	31.8	0.0	32.0	0.0	32.0			
Incr Delay (d2), s/veh	562.4	1.1	0.0	0.0	16.5	0.0	249.4	0.0	50.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	66.7	9.1	0.0	0.0	13.6	0.0	52.5	0.0	18.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	600.0	15.5	0.0	0.0	48.4	0.0	281.5	0.0	82.7			
LnGrp LOS	F	B	A	A	D		F	A	F			
Approach Vol, veh/h		2219			1065			1430				
Approach Delay, s/veh		235.7			48.4			206.7				
Approach LOS		F			D			F				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		59.5			24.2	35.3		35.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		54.2			* 20	30.0		31.0				
Max Q Clear Time (g_c+I1), s		28.1			22.0	29.9		33.0				
Green Ext Time (p_c), s		14.8			0.0	0.1		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	184.6
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1701	1454	368	1583	0	0	0	0	517	0	586
Future Volume (veh/h)	0	1701	1454	368	1583	0	0	0	0	517	0	586
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1701	1454	368	1583	0				517	0	586
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1874	582	312	1075	0				622	0	554
Arrive On Green	0.00	0.37	0.37	0.18	0.57	0.00				0.35	0.00	0.35
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	0	1585
Grp Volume(v), veh/h	0	1701	1454	368	1583	0				517	0	586
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1585
Q Serve(g_s), s	0.0	41.1	47.7	22.8	74.7	0.0				34.6	0.0	45.4
Cycle Q Clear(g_c), s	0.0	41.1	47.7	22.8	74.7	0.0				34.6	0.0	45.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1874	582	312	1075	0				622	0	554
V/C Ratio(X)	0.00	0.91	2.50	1.18	1.47	0.00				0.83	0.00	1.06
Avail Cap(c_a), veh/h	0	1874	582	312	1075	0				622	0	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	39.1	41.2	53.6	27.6	0.0				38.8	0.0	42.3
Incr Delay (d2), s/veh	0.0	6.9	680.1	108.3	217.9	0.0				9.5	0.0	54.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	17.6	127.6	19.3	94.9	0.0				16.1	0.0	25.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	46.0	721.3	161.9	245.6	0.0				48.3	0.0	97.0
LnGrp LOS	A	D	F	F	F	A				D	A	F
Approach Vol, veh/h		3155			1951						1103	
Approach Delay, s/veh		357.2			229.8						74.2	
Approach LOS		F			F						E	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	27.0	53.0		50.0		80.0
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3
Max Green Setting (Gmax), s	* 23	47.7		45.4		74.7
Max Q Clear Time (g_c+I1), s	24.8	49.7		47.4		76.7
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	266.9
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	573	94	865	591	450	348	193	430	429	65	54
Future Volume (veh/h)	110	573	94	865	591	450	348	193	430	429	65	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	110	573	94	865	591	450	348	193	430	429	65	54
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	139	859	383	618	1218	543	355	364	542	318	618	276
Arrive On Green	0.08	0.24	0.24	0.18	0.34	0.34	0.20	0.19	0.19	0.18	0.17	0.17
Sat Flow, veh/h	1781	3554	1585	3456	3554	1585	1781	1870	2790	1781	3554	1585
Grp Volume(v), veh/h	110	573	94	865	591	450	348	193	430	429	65	54
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1728	1777	1585	1781	1870	1395	1781	1777	1585
Q Serve(g_s), s	5.9	14.2	4.7	17.4	12.8	25.4	18.9	9.0	14.3	17.4	1.5	2.8
Cycle Q Clear(g_c), s	5.9	14.2	4.7	17.4	12.8	25.4	18.9	9.0	14.3	17.4	1.5	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	859	383	618	1218	543	355	364	542	318	618	276
V/C Ratio(X)	0.79	0.67	0.25	1.40	0.49	0.83	0.98	0.53	0.79	1.35	0.11	0.20
Avail Cap(c_a), veh/h	209	1712	763	618	1931	861	355	753	1123	318	1401	625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	33.4	29.8	40.0	25.2	29.4	38.8	35.2	37.4	40.0	33.8	34.4
Incr Delay (d2), s/veh	11.5	0.9	0.3	190.0	0.3	3.8	42.4	1.2	2.7	176.0	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	6.1	1.7	23.5	5.3	9.4	11.9	4.0	4.8	22.8	0.6	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.7	34.3	30.1	230.0	25.5	33.2	81.2	36.4	40.0	216.0	33.9	34.7
LnGrp LOS	E	C	C	F	C	C	F	D	D	F	C	C
Approach Vol, veh/h		777			1906			971			548	
Approach Delay, s/veh		36.8			120.1			54.1			176.5	
Approach LOS		D			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	28.6	24.0	22.7	12.2	38.5	22.0	24.7
Change Period (Y+Rc), s	4.6	5.1	4.6	* 5.8	4.6	5.1	4.6	5.8
Max Green Setting (Gmax), s	17.4	46.9	19.4	* 38	11.4	52.9	17.4	39.2
Max Q Clear Time (g_c+I1), s	19.4	16.2	20.9	4.8	7.9	27.4	19.4	16.3
Green Ext Time (p_c), s	0.0	4.4	0.0	0.5	0.1	6.0	0.0	2.6

Intersection Summary	
HCM 6th Ctrl Delay	96.8
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	17	348	84	29	28	326	830	40	53	581	97
Future Volume (veh/h)	115	17	348	84	29	28	326	830	40	53	581	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	17	348	84	29	28	326	830	40	53	581	97
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	146	21	421	131	234	226	368	1732	83	107	887	146
Arrive On Green	0.08	0.28	0.28	0.07	0.27	0.27	0.21	0.35	0.35	0.06	0.20	0.20
Sat Flow, veh/h	1781	74	1522	1781	874	844	1781	4991	240	1781	4418	726
Grp Volume(v), veh/h	115	0	365	84	0	57	326	565	305	53	446	232
Grp Sat Flow(s),veh/h/ln	1781	0	1596	1781	0	1718	1781	1702	1827	1781	1702	1740
Q Serve(g_s), s	5.1	0.0	17.4	3.7	0.0	2.0	14.4	10.5	10.6	2.3	9.8	10.0
Cycle Q Clear(g_c), s	5.1	0.0	17.4	3.7	0.0	2.0	14.4	10.5	10.6	2.3	9.8	10.0
Prop In Lane	1.00		0.95	1.00		0.49	1.00		0.13	1.00		0.42
Lane Grp Cap(c), veh/h	146	0	441	131	0	460	368	1181	634	107	683	349
V/C Ratio(X)	0.79	0.00	0.83	0.64	0.00	0.12	0.89	0.48	0.48	0.49	0.65	0.67
Avail Cap(c_a), veh/h	220	0	689	220	0	742	439	1469	789	220	1049	536
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	0.0	27.5	36.5	0.0	22.5	31.3	20.7	20.7	36.9	29.8	29.9
Incr Delay (d2), s/veh	10.3	0.0	6.3	5.2	0.0	0.2	17.1	0.4	0.8	3.5	1.5	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	7.2	1.8	0.0	0.8	7.4	3.8	4.1	1.1	3.8	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	0.0	33.8	41.7	0.0	22.7	48.3	21.2	21.6	40.4	31.3	33.0
LnGrp LOS	D	A	C	D	A	C	D	C	C	D	C	C
Approach Vol, veh/h		480			141			1196			731	
Approach Delay, s/veh		36.9			34.0			28.7			32.5	
Approach LOS		D			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.5	27.1	21.3	22.1	11.3	26.4	9.5	33.9				
Change Period (Y+Rc), s	4.6	* 4.7	4.6	5.8	4.6	* 4.7	4.6	5.8				
Max Green Setting (Gmax), s	10.0	* 35	20.0	25.0	10.0	* 35	10.0	35.0				
Max Q Clear Time (g_c+I1), s	5.7	19.4	16.4	12.0	7.1	4.0	4.3	12.6				
Green Ext Time (p_c), s	0.1	3.0	0.3	4.3	0.1	0.4	0.0	7.3				
Intersection Summary												
HCM 6th Ctrl Delay			31.6									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	653	1552	157	982	1886	464	224	309	618	739	256	445
Future Volume (veh/h)	653	1552	157	982	1886	464	224	309	618	739	256	445
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	653	1552	157	982	1886	464	224	309	618	739	256	445
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	579	1507	468	811	1883	585	246	495	925	734	925	553
Arrive On Green	0.17	0.30	0.30	0.23	0.37	0.37	0.14	0.10	0.10	0.21	0.18	0.18
Sat Flow, veh/h	3456	5106	1585	3456	5106	1585	1781	5106	2790	3456	5106	1585
Grp Volume(v), veh/h	653	1552	157	982	1886	464	224	309	618	739	256	445
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1585	1781	1702	1395	1728	1702	1585
Q Serve(g_s), s	25.0	44.0	8.1	35.0	55.0	20.9	18.5	8.7	0.0	31.7	6.4	27.0
Cycle Q Clear(g_c), s	25.0	44.0	8.1	35.0	55.0	20.9	18.5	8.7	0.0	31.7	6.4	27.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	579	1507	468	811	1883	585	246	495	925	734	925	553
V/C Ratio(X)	1.13	1.03	0.34	1.21	1.00	0.79	0.91	0.62	0.67	1.01	0.28	0.81
Avail Cap(c_a), veh/h	579	1507	468	811	1883	585	269	822	1104	734	925	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.1	52.6	20.4	57.1	47.1	12.1	63.3	64.7	42.8	58.7	52.6	44.0
Incr Delay (d2), s/veh	77.5	31.2	0.4	106.2	21.1	7.4	31.0	1.3	1.2	35.1	0.2	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.0	22.6	3.0	26.9	26.1	8.1	10.3	3.8	9.7	17.0	2.7	15.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	139.5	83.8	20.8	163.2	68.1	19.5	94.3	66.0	44.0	93.8	52.8	52.5
LnGrp LOS	F	F	C	F	F	B	F	E	D	F	D	D
Approach Vol, veh/h		2362			3332			1151			1440	
Approach Delay, s/veh		95.0			89.4			59.7			73.7	
Approach LOS		F			F			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	41.0	50.0	25.1	33.0	30.0	61.0	37.7	20.5
Change Period (Y+Rc), s	6.0	* 6	4.5	6.0	5.0	6.0	6.0	* 6
Max Green Setting (Gmax), s	35.0	* 44	22.5	27.0	25.0	54.0	25.5	* 24
Max Q Clear Time (g_c+I1), s	37.0	46.0	20.5	29.0	27.0	57.0	33.7	10.7
Green Ext Time (p_c), s	0.0	0.0	0.1	0.0	0.0	0.0	0.0	3.8

Intersection Summary	
HCM 6th Ctrl Delay	84.1
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	20	13	4	48	111	1	460	1	160	471	185
Future Volume (veh/h)	170	20	13	4	48	111	1	460	1	160	471	185
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	170	20	13	4	48	111	1	460	1	160	471	185
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	225	435	369	8	206	175	4	1266	3	212	1830	568
Arrive On Green	0.13	0.23	0.23	0.00	0.11	0.11	0.00	0.24	0.24	0.12	0.36	0.36
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	5261	11	1781	5106	1585
Grp Volume(v), veh/h	170	20	13	4	48	111	1	298	163	160	471	185
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1702	1868	1781	1702	1585
Q Serve(g_s), s	4.6	0.4	0.3	0.1	1.2	3.3	0.0	3.6	3.6	4.3	3.2	4.2
Cycle Q Clear(g_c), s	4.6	0.4	0.3	0.1	1.2	3.3	0.0	3.6	3.6	4.3	3.2	4.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	225	435	369	8	206	175	4	819	450	212	1830	568
V/C Ratio(X)	0.75	0.05	0.04	0.52	0.23	0.63	0.28	0.36	0.36	0.76	0.26	0.33
Avail Cap(c_a), veh/h	719	944	800	719	944	800	719	2061	1131	719	3091	960
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	14.8	14.7	24.6	20.1	21.1	24.7	15.7	15.7	21.1	11.2	11.5
Incr Delay (d2), s/veh	5.1	0.0	0.0	45.1	0.6	3.8	37.4	1.0	1.8	5.4	0.3	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.2	0.1	0.1	0.5	1.2	0.0	1.2	1.5	1.8	1.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.0	14.8	14.8	69.7	20.7	24.9	62.1	16.6	17.4	26.5	11.5	12.7
LnGrp LOS	C	B	B	E	C	C	E	B	B	C	B	B
Approach Vol, veh/h		203			163			462			816	
Approach Delay, s/veh		24.2			24.7			17.0			14.7	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	16.5	4.6	23.8	10.8	10.5	10.4	17.9
Change Period (Y+Rc), s	4.5	5.0	4.5	6.0	4.5	5.0	4.5	6.0
Max Green Setting (Gmax), s	20.0	25.0	20.0	30.0	20.0	25.0	20.0	30.0
Max Q Clear Time (g_c+I1), s	2.1	2.4	2.0	6.2	6.6	5.3	6.3	5.6
Green Ext Time (p_c), s	0.0	0.1	0.0	8.7	0.4	0.5	0.3	6.3

Intersection Summary	
HCM 6th Ctrl Delay	17.5
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1853	87	298	1977	280	30	46	285	218	48	36
Future Volume (veh/h)	83	1853	87	298	1977	280	30	46	285	218	48	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	83	1853	87	298	1977	280	30	46	285	218	48	36
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	89	2019	95	289	1834	818	45	228	450	232	232	174
Arrive On Green	0.05	0.40	0.40	0.16	0.52	0.52	0.03	0.12	0.12	0.13	0.23	0.23
Sat Flow, veh/h	1781	4998	234	1781	3554	1585	1781	1870	1585	1781	992	744
Grp Volume(v), veh/h	83	1261	679	298	1977	280	30	46	285	218	0	84
Grp Sat Flow(s),veh/h/ln	1781	1702	1828	1781	1777	1585	1781	1870	1585	1781	0	1736
Q Serve(g_s), s	6.2	46.9	47.1	21.7	69.0	7.5	2.2	3.0	13.2	16.2	0.0	5.2
Cycle Q Clear(g_c), s	6.2	46.9	47.1	21.7	69.0	7.5	2.2	3.0	13.2	16.2	0.0	5.2
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	89	1375	739	289	1834	818	45	228	450	232	0	405
V/C Ratio(X)	0.93	0.92	0.92	1.03	1.08	0.34	0.67	0.20	0.63	0.94	0.00	0.21
Avail Cap(c_a), veh/h	89	1375	739	289	1834	818	85	469	655	232	0	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.2	37.7	37.8	56.0	32.3	5.5	64.6	52.9	19.0	57.6	0.0	41.3
Incr Delay (d2), s/veh	72.2	9.7	16.3	61.0	45.4	0.4	15.9	0.4	1.5	42.7	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	20.9	23.9	14.4	38.9	4.6	1.2	1.4	4.9	10.0	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	135.5	47.4	54.1	117.0	77.8	5.8	80.6	53.3	20.5	100.3	0.0	41.5
LnGrp LOS	F	D	D	F	F	A	F	D	C	F	A	D
Approach Vol, veh/h		2023			2555			361			302	
Approach Delay, s/veh		53.3			74.5			29.7			84.0	
Approach LOS		D			E			C			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.0	60.0	9.0	37.7	12.0	75.0	23.9	22.8
Change Period (Y+Rc), s	5.3	6.0	5.6	6.5	5.3	6.0	6.5	* 6.5
Max Green Setting (Gmax), s	21.7	54.0	6.4	44.5	6.7	69.0	17.4	* 34
Max Q Clear Time (g_c+I1), s	23.7	49.1	4.2	7.2	8.2	71.0	18.2	15.2
Green Ext Time (p_c), s	0.0	3.6	0.0	0.4	0.0	0.0	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	63.7
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	0	21	59	152	38	37	49	84	117	33	53	0
Future Vol, veh/h	0	21	59	152	38	37	49	84	117	33	53	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	21	59	152	38	37	49	84	117	33	53	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	10.1	9.7	8.8
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	0%	67%	38%
Vol Thru, %	34%	26%	17%	62%
Vol Right, %	47%	74%	16%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	80	227	86
LT Vol	49	0	152	33
Through Vol	84	21	38	53
RT Vol	117	59	37	0
Lane Flow Rate	250	80	227	86
Geometry Grp	1	1	1	1
Degree of Util (X)	0.316	0.102	0.306	0.121
Departure Headway (Hd)	4.544	4.573	4.852	5.056
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	788	777	738	704
Service Time	2.595	2.642	2.909	3.119
HCM Lane V/C Ratio	0.317	0.103	0.308	0.122
HCM Control Delay	9.7	8.2	10.1	8.8
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	1.4	0.3	1.3	0.4

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	42	0	11	31	34	0	0	6	36	0	4
Future Vol, veh/h	0	42	0	11	31	34	0	0	6	36	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	42	0	11	31	34	0	0	6	36	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	65	0	0	42	0	0	114	129	42	115	112	48
Stage 1	-	-	-	-	-	-	42	42	-	70	70	-
Stage 2	-	-	-	-	-	-	72	87	-	45	42	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1537	-	-	1567	-	-	863	762	1029	862	778	1021
Stage 1	-	-	-	-	-	-	972	860	-	940	837	-
Stage 2	-	-	-	-	-	-	938	823	-	969	860	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1537	-	-	1567	-	-	855	757	1029	853	773	1021
Mov Cap-2 Maneuver	-	-	-	-	-	-	855	757	-	853	773	-
Stage 1	-	-	-	-	-	-	972	860	-	940	831	-
Stage 2	-	-	-	-	-	-	928	817	-	963	860	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.1	8.5	9.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1029	1537	-	-	1567	-	-	867
HCM Lane V/C Ratio	0.006	-	-	-	0.007	-	-	0.046
HCM Control Delay (s)	8.5	0	-	-	7.3	0	-	9.4
HCM Lane LOS	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	12	16	203	253	7
Future Vol, veh/h	12	12	16	203	253	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	12	16	203	253	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	492	257	260	0	-	0
Stage 1	257	-	-	-	-	-
Stage 2	235	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	536	782	1304	-	-	-
Stage 1	786	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	528	782	1304	-	-	-
Mov Cap-2 Maneuver	528	-	-	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	804	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1304	-	630	-	-
HCM Lane V/C Ratio	0.012	-	0.038	-	-
HCM Control Delay (s)	7.8	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	3.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	18	32	10	32	54
Future Vol, veh/h	16	18	32	10	32	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	18	32	10	32	54

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	155	37	0	0	42	0
Stage 1	37	-	-	-	-	-
Stage 2	118	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	836	1035	-	-	1567	-
Stage 1	985	-	-	-	-	-
Stage 2	907	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	818	1035	-	-	1567	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	2.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	920	1567	-
HCM Lane V/C Ratio	-	-	0.037	0.02	-
HCM Control Delay (s)	-	-	9.1	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	81	1801	1665	378	222	48
Future Volume (veh/h)	81	1801	1665	378	222	48
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	81	1801	1665	378	222	48
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	105	2686	1882	411	264	234
Arrive On Green	0.06	0.76	0.65	0.65	0.15	0.15
Sat Flow, veh/h	1781	3647	2993	634	1781	1585
Grp Volume(v), veh/h	81	1801	995	1048	222	48
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1756	1781	1585
Q Serve(g_s), s	4.7	26.1	46.5	53.9	12.6	2.8
Cycle Q Clear(g_c), s	4.7	26.1	46.5	53.9	12.6	2.8
Prop In Lane	1.00			0.36	1.00	1.00
Lane Grp Cap(c), veh/h	105	2686	1153	1140	264	234
V/C Ratio(X)	0.77	0.67	0.86	0.92	0.84	0.20
Avail Cap(c_a), veh/h	257	3076	1196	1182	600	534
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.3	6.3	14.6	15.9	43.1	38.9
Incr Delay (d2), s/veh	11.5	0.5	6.5	11.2	7.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	7.4	18.0	21.8	6.1	2.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	59.7	6.8	21.1	27.1	50.3	39.3
LnGrp LOS	E	A	C	C	D	D
Approach Vol, veh/h		1882	2043		270	
Approach Delay, s/veh		9.0	24.2		48.3	
Approach LOS		A	C		D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		83.6		20.4	11.1	72.5
Change Period (Y+Rc), s		5.0		5.0	5.0	5.0
Max Green Setting (Gmax), s		90.0		35.0	15.0	70.0
Max Q Clear Time (g_c+I1), s		28.1		14.6	6.7	55.9
Green Ext Time (p_c), s		25.7		0.8	0.1	11.5

Intersection Summary			
HCM 6th Ctrl Delay			18.9
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	363	1399	0	0	1397	363	482	7	559	0	0	0
Future Volume (veh/h)	363	1399	0	0	1397	363	482	7	559	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	363	1399	0	0	1397	363	482	7	559			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	341	2127	0	0	1062	268	257	4	298			
Arrive On Green	0.19	0.60	0.00	0.00	0.38	0.38	0.33	0.33	0.33			
Sat Flow, veh/h	1781	3647	0	0	2903	710	769	11	892			
Grp Volume(v), veh/h	363	1399	0	0	868	892	1048	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1743	1671	0	0			
Q Serve(g_s), s	26.0	35.5	0.0	0.0	51.4	51.4	45.4	0.0	0.0			
Cycle Q Clear(g_c), s	26.0	35.5	0.0	0.0	51.4	51.4	45.4	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		0.41	0.46		0.53			
Lane Grp Cap(c), veh/h	341	2127	0	0	672	659	558	0	0			
V/C Ratio(X)	1.07	0.66	0.00	0.00	1.29	1.35	1.88	0.00	0.00			
Avail Cap(c_a), veh/h	341	2232	0	0	672	659	558	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	55.0	18.1	0.0	0.0	42.3	42.3	45.3	0.0	0.0			
Incr Delay (d2), s/veh	67.3	0.9	0.0	0.0	142.9	169.0	402.0	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	17.9	14.2	0.0	0.0	48.6	52.5	80.4	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	122.3	19.0	0.0	0.0	185.2	211.3	447.3	0.0	0.0			
LnGrp LOS	F	B	A	A	F	F	F	A	A			
Approach Vol, veh/h		1762			1760			1048				
Approach Delay, s/veh		40.3			198.4			447.3				
Approach LOS		D			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		86.0			30.0	56.0		50.0				
Change Period (Y+Rc), s		4.6			4.0	4.6		4.6				
Max Green Setting (Gmax), s		85.4			26.0	51.4		45.4				
Max Q Clear Time (g_c+I1), s		37.5			28.0	53.4		47.4				
Green Ext Time (p_c), s		27.3			0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			194.5									
HCM 6th LOS			F									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1296	540	379	1500	0	0	0	0	466	11	406
Future Volume (veh/h)	0	1296	540	379	1500	0	0	0	0	466	11	406
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1296	540	379	1500	0				466	11	406
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1403	579	331	1141	0				289	7	251
Arrive On Green	0.00	0.40	0.40	0.19	0.61	0.00				0.32	0.32	0.32
Sat Flow, veh/h	0	3715	1464	1781	1870	0				890	21	775
Grp Volume(v), veh/h	0	1243	593	379	1500	0				883	0	0
Grp Sat Flow(s),veh/h/ln	0	1702	1607	1781	1870	0				1686	0	0
Q Serve(g_s), s	0.0	48.7	49.4	26.0	85.4	0.0				45.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	48.7	49.4	26.0	85.4	0.0				45.4	0.0	0.0
Prop In Lane	0.00		0.91	1.00		0.00				0.53		0.46
Lane Grp Cap(c), veh/h	0	1347	636	331	1141	0				547	0	0
V/C Ratio(X)	0.00	0.92	0.93	1.15	1.31	0.00				1.61	0.00	0.00
Avail Cap(c_a), veh/h	0	1347	636	331	1141	0				547	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	40.3	40.5	57.0	27.3	0.0				47.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	11.1	21.1	95.1	147.9	0.0				285.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	22.0	22.9	20.3	82.1	0.0				61.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	51.3	61.6	152.1	175.2	0.0				332.3	0.0	0.0
LnGrp LOS	A	D	E	F	F	A				F	A	A
Approach Vol, veh/h		1836			1879						883	
Approach Delay, s/veh		54.7			170.6						332.3	
Approach LOS		D			F						F	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	30.0	60.0		50.0		90.0
Change Period (Y+Rc), s	4.0	4.6		4.6		4.6
Max Green Setting (Gmax), s	26.0	51.4		45.4		85.4
Max Q Clear Time (g_c+I1), s	28.0	51.4		47.4		87.4
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		155.3
HCM 6th LOS		F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	667	1594	0	0	1540	748	1579	8	619	0	0	0
Future Volume (veh/h)	667	1594	0	0	1540	748	1579	8	619	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	667	1594	0	0	1540	0	1579	8	619			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	374	1991	0	0	1089		595	3	532			
Arrive On Green	0.21	0.56	0.00	0.00	0.31	0.00	0.34	0.34	0.34			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	1773	9	1585			
Grp Volume(v), veh/h	667	1594	0	0	1540	0	1587	0	619			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1782	0	1585			
Q Serve(g_s), s	20.0	34.1	0.0	0.0	29.2	0.0	32.0	0.0	32.0			
Cycle Q Clear(g_c), s	20.0	34.1	0.0	0.0	29.2	0.0	32.0	0.0	32.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	374	1991	0	0	1089		598	0	532			
V/C Ratio(X)	1.78	0.80	0.00	0.00	1.41		2.65	0.00	1.16			
Avail Cap(c_a), veh/h	374	1991	0	0	1089		598	0	532			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	37.7	16.7	0.0	0.0	33.1	0.0	31.7	0.0	31.7			
Incr Delay (d2), s/veh	363.5	2.6	0.0	0.0	191.9	0.0	748.5	0.0	92.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	46.0	12.4	0.0	0.0	40.7	0.0	137.0	0.0	24.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	401.2	19.3	0.0	0.0	225.0	0.0	780.1	0.0	124.1			
LnGrp LOS	F	B	A	A	F		F	A	F			
Approach Vol, veh/h		2261			1540			2206				
Approach Delay, s/veh		131.9			225.0			596.1				
Approach LOS		F			F			F				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		58.7			24.2	34.5		36.6				
Change Period (Y+Rc), s		5.3			* 4.2	5.3		4.6				
Max Green Setting (Gmax), s		53.2			* 20	29.2		32.0				
Max Q Clear Time (g_c+I1), s		36.1			22.0	31.2		34.0				
Green Ext Time (p_c), s		12.6			0.0	0.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			326.2									
HCM 6th LOS			F									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
14: I-5 SB On Ramp/I-5 SB Off Ramp & River Island Pkwy/E Louise Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1783	1265	396	2724	0	0	0	0	479	0	817
Future Volume (veh/h)	0	1783	1265	396	2724	0	0	0	0	479	0	817
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	1783	1265	396	2724	0				479	0	817
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1874	582	312	1075	0				622	0	554
Arrive On Green	0.00	0.37	0.37	0.18	0.57	0.00				0.35	0.00	0.35
Sat Flow, veh/h	0	5274	1585	1781	1870	0				1781	0	1585
Grp Volume(v), veh/h	0	1783	1265	396	2724	0				479	0	817
Grp Sat Flow(s),veh/h/ln	0	1702	1585	1781	1870	0				1781	0	1585
Q Serve(g_s), s	0.0	44.2	47.7	22.8	74.7	0.0				31.1	0.0	45.4
Cycle Q Clear(g_c), s	0.0	44.2	47.7	22.8	74.7	0.0				31.1	0.0	45.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1874	582	312	1075	0				622	0	554
V/C Ratio(X)	0.00	0.95	2.18	1.27	2.53	0.00				0.77	0.00	1.48
Avail Cap(c_a), veh/h	0	1874	582	312	1075	0				622	0	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	40.0	41.2	53.6	27.6	0.0				37.7	0.0	42.3
Incr Delay (d2), s/veh	0.0	11.5	534.4	143.3	693.3	0.0				6.0	0.0	223.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	19.6	104.0	22.4	236.9	0.0				14.1	0.0	51.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	51.5	575.6	196.9	721.0	0.0				43.7	0.0	266.1
LnGrp LOS	A	D	F	F	F	A				D	A	F
Approach Vol, veh/h		3048			3120						1296	
Approach Delay, s/veh		269.0			654.5						183.9	
Approach LOS		F			F						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	27.0	53.0		50.0		80.0						
Change Period (Y+Rc), s	* 4.2	5.3		4.6		5.3						
Max Green Setting (Gmax), s	* 23	47.7		45.4		74.7						
Max Q Clear Time (g_c+I1), s	24.8	49.7		47.4		76.7						
Green Ext Time (p_c), s	0.0	0.0		0.0		0.0						
Intersection Summary												
HCM 6th Ctrl Delay			415.3									
HCM 6th LOS			F									
Notes												
User approved volume balancing among the lanes for turning movement.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

APPENDIX F

Water Supply Assessment

DRAFT REPORT | MAY 2024

Mossdale Landing West Specific Plan Water Supply Assessment

PREPARED FOR

City of Lathrop

PREPARED BY

West Yost

Water. Engineered.

Mossdale Landing West Specific Plan Water Supply Assessment

Prepared for

City of Lathrop

Project No. 487-60-23-33

Prepared by: Whitney Jones — May 16, 2024

QA/QC Review: Elizabeth Drayer — May 16, 2024

WEST YOST
Water. Engineered.

Table of Contents

Table of Contents

LIST OF TABLES

Table of Contents

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

AF	Acre-Feet
AFY	Acre-Feet per Year
Bay-Delta Plan Amendment	Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary
CEQA	California Environmental Quality Act
City	City of Lathrop
CTF	Consolidated Treatment Facility
CWC	California Water Code
DDW	Division of Drinking Water
EIR	Environmental Impact Report
USEPA	United States Environmental Protection Agency
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
LAWTF	Louise Avenue Water Treatment Facility
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter
MOU	Memorandum of Understanding
MWQCF	Manteca Water Quality Control Facility
NPDES	National Pollutant Discharge Elimination System
OCC	Occidental Chemical Corporation
PFAS	Per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonic acid
PHG	Public Health Goal
ppt	Parts per trillion
Proposed Project	Mossdale Landing West Specific Plan
SB	Senate Bill
SCWSP	South County Water Supply Program
SGMA	Sustainable Groundwater Management Act
SSJID	South San Joaquin Irrigation District
SWRCB	State Water Resources Control Board
TDS	Total dissolved solids
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WLSP	West Lathrop Specific Plan
WSA	Water Supply Assessment
WSCP	Water Shortage Contingency Plan

Mossdale Landing West Specific Plan
Water Supply Assessment

EXECUTIVE SUMMARY

Overview

This Water Supply Assessment (WSA) has been prepared in accordance with California Water Code sections 10910 through 10915 in connection with the proposed Mossdale Landing West Project (Proposed Project), as presented in the Mossdale Landing West Specific Plan (O'Dell Engineering, 2023; herein referred to as the Specific Plan). The Proposed Project site is located within the City of Lathrop (City), bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north and south. The Proposed Project would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements.

Projected Water Demands

The projected water demands for buildout of the Proposed Project are 378 acre-feet per year (AFY), which includes 337 AFY of potable water and 41 AFY of recycled water. Water demands for the Proposed Project were estimated using data provided in the Specific Plan and the Mossdale Landing West Vesting Tentative Map (O'Dell Engineering, 2024).

This WSA references water demand projections for the City as presented in the 2020 Urban Water Management Plan (UWMP). The Proposed Project area was envisioned for future development within the 2020 UWMP, but the Proposed Project was not entirely accounted for in the growth forecasts considered in the 2020 UWMP, so its water demand was not entirely included in the 2020 UWMP water demand projections. The 2020 UWMP included 658 residential units within the Proposed Project area, with an associated water demand projection of 243 AFY. Thus, the Proposed Project has an incremental additional water demand of 135 AFY that was not included in the City's 2020 UWMP.

This WSA provides an assessment of available water supply for the City during normal, single dry, and multiple dry water years for a 20-year projection and compares it to existing and planned future water demands included in the 2020 UWMP, including the incremental additional water demand associated with the Proposed Project.

Water Supply Availability and Reliability

The City receives water through the South County Water Supply Program (SCWSP) based on an agreement with the South San Joaquin Irrigation District (SSJID), and pumps groundwater from City-owned and operated wells from the Tracy Subbasin. The availability and reliability of the City's water supplies as described in this WSA are based primarily on information contained in the City's 2020 UWMP. The City's 2020 UWMP is incorporated by reference into this WSA.

The reliability of the SCWSP supply is highly dependent on the assumption of whether the 2018 Bay-Delta Plan Amendment is implemented. The Bay-Delta Plan Amendment was adopted in December 2018 by the State Water Resources Control Board (SWRCB) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 40 percent of the "unimpaired flow" on the three tributaries from February through June in every year type, whether wet, normal, dry, or critically dry. The implementation of the Bay-Delta Plan Amendment significantly impacts the SCWSP supply reliability in dry years; however, the actual implementation of the Bay-Delta Plan Amendment is uncertain. In November 2022, key stakeholders signed a Memorandum of Understanding (MOU) indicating a mutual agreement among the signatories to commit to collaborate with the state. While a Voluntary Agreement is still not finalized, the signing of a MOU signals that stakeholders are committed to reaching an agreement.

Despite the uncertainties surrounding the implementation of the Bay-Delta Plan Amendment, SSJID's 2020 UWMP assumed the Bay-Delta Plan Amendment would not be implemented. The City's 2020 UWMP reflects the same assumption. As such, this WSA also assumes the Bay-Delta Plan Amendment will not be implemented.

Pursuant to Water Code Section 10910(c)(4) and based on the technical analyses described in this WSA, the total projected water supplies determined to be available for the Proposed Project during normal, single dry, and multiple dry years during a 20-year projection will not consistently meet the projected water demand associated with the Proposed Project, in addition to existing and planned future uses. With the Proposed Project, the City is projected to have adequate water supplies to meet projected water demands in all year types through 2040, but would experience up to a 3 percent shortfall (450 AF) in 2045 in single dry years and the third and fourth years of a multiple dry year period. The City's 2020 UWMP also notes this water supply deficiency, and outlines strategies and actions to minimize potential for water supply shortfalls.

If supply shortfalls do occur, the City expects to meet these supply shortfalls through water demand reductions and other shortage response actions by implementing its Water Shortage Contingency Plan (WSCP), which can be enacted upon City Council declaration. Section 9.3 of this WSA provides further detail on the City's WSCP. The City is also developing a recycled water program that will support the use of recycled water to irrigate public landscaping by 2025, which will offset potable water demand for irrigation purposes within the City. If additional recycled water is made available, the potable water demands will be less than the current projections and therefore the resultant supply shortage will likely be smaller.

In addition, the City has been implementing, and plans to continue to implement, demand management measures. These consist of:

- Water waste prevention ordinances
- Metering
- Conservation pricing
- Public education and outreach
- Programs to assess and manage distribution system real loss
- Water conservation program coordination and staffing support
- Other management measures

The City is also evaluating water supply options that could bolster the City's dry year supply reliability, such as additional groundwater treatment, aquifer storage and recovery, indirect potable reuse, as well as support for implementation of SCWSP Phase II or other reliability projects.

1.0 INTRODUCTION

The proposed Mossdale Landing West Project (Proposed Project), as presented in the Mossdale Landing West Specific Plan (O'Dell Engineering, 2023, herein referred to as the Specific Plan) includes the construction of up to 912 low density residential dwelling units with associated park, circulation, and utility improvements. The purpose of this Water Supply Assessment (WSA) is to support the Environmental Impact Report (EIR) for the Proposed Project. The following sections describe the legal requirement for the WSA and the project background.

1.1 Legal Requirement for a Water Supply Assessment

California Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 and SB 221 were companion measures which sought to promote more collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. The purpose of this coordination is to ensure that prudent water supply planning has been conducted, and that planned water supplies are adequate to meet existing demands, anticipated demands from approved projects and tentative maps, and the demands of proposed projects.

SB 610 amended California Water Code Sections 10910 through 10915 (inclusive) to require lead agencies conducting environmental review under the California Environmental Quality Act (CEQA) for a proposed development project[1] that meets specified criteria to:

- Identify any public water purveyor that may supply water for the proposed development project; and
- Request a WSA from the identified water purveyor(s).

The purpose of a WSA is to demonstrate the sufficiency of the purveyor's water supplies to satisfy the water demands of the proposed project, while still meeting the water purveyor's existing and planned future uses. Water Code Sections 10910 through 10915 set forth the specific information that must be included in a WSA.

SB 221 amended State law (California Government Code Section 66473.7) to require that approval by a city or county of certain residential subdivisions[2] requires an affirmative written verification of sufficient water supply. SB 221 was intended as a failsafe mechanism to ensure that collaboration on finding the needed water supplies to serve a new large residential subdivision occurs before construction begins.

1.2 Need for and Purpose of a Water Supply Assessment

The purpose of this WSA is to perform the evaluation required by SB 610 (Water Code Sections 10910 through 10915) in connection with the proposed Mossdale Landing West Specific Plan (Proposed Project),

---

[1] The definition of a "project" subject to the requirement to prepare a WSA is provided in Water Code Section 10912(a) and is discussed further in Section 3.1 of this WSA.

[2] Per Government Code Section 66473.7(a)(1) subdivision means a proposed residential development of more than 500 dwelling units.

located within the City of Lathrop's water service area. This WSA does not reserve water, or function as a "will serve" letter or any other form of commitment to supply water (see Water Code Section 10914). The provision of water service will continue to be undertaken in a manner consistent with applicable policies and procedures, consistent with existing law.

1.3 Water Supply Assessment Preparation, Format, and Organization

The format of this WSA is intended to follow Water Code Sections 10910 through 10915 to clearly delineate compliance with the specific requirements for a WSA. This WSA includes the following sections:

Section 1: Introduction
Section 2: Description of the Proposed Project
Section 3: Required Determinations
Section 4: City of Lathrop Water System
Section 5: City of Lathrop Water Demands
Section 6: City of Lathrop Water Supplies
Section 7: Water Supply Reliability
Section 8: Determination of Water Supply Sufficiency Based on the Requirements of SB 610
Section 9: Verification of Water Supply Sufficiency Based on the Requirements of SB 221
Section 10: Water Supply Assessment Approval Process
Section 11: References

Relevant citations of Water Code sections 10910 through 10915 are included throughout this WSA in *italics* to demonstrate compliance with the specific requirements of SB 610.

2.0 DESCRIPTION OF THE PROPOSED PROJECT

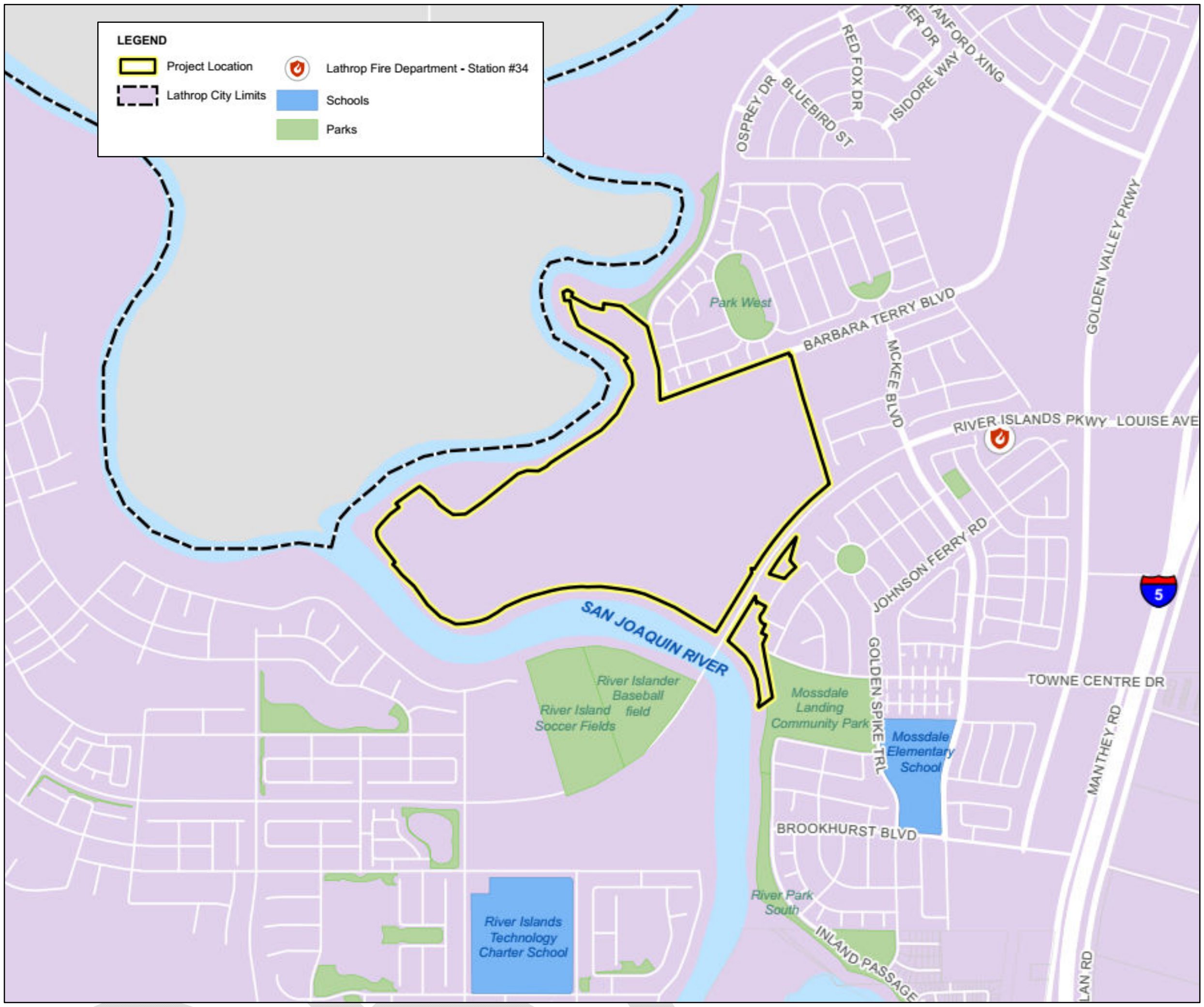
The following sections describe the Proposed Project, including its location, proposed land uses, and projected water demand.

2.1 Proposed Project Location and Overview

The Proposed Project is located in the City of Lathrop (City), within existing City limits as shown on Figure 2-1. The Proposed Project site consists of six separate parcels bounded by Barbara Terry Boulevard to the north, open space and an existing subdivision to the northeast, River Islands Parkway to the southeast, and the San Joaquin River to the west, north, and south. The site is located within the West Lathrop Specific Plan (WLSP) area in the City.

According to the Vesting Tentative Map for the Proposed Project (O'Dell Engineering, 2024), the Proposed Project site is approximately 205.9 acres. The approximate area associated with each land use type is summarized below:

- Up to 912 new low-density residential dwelling units (146.7 acres)
  - Includes the proposed 829 residential dwelling units for the Proposed Project plus a 10 percent buffer
- Public designated land uses that are made up of:
  - Approximately 4.4 acres for the River Islands Parkway
  - Approximately 4.8 acres of linear park (irrigated)
  - Approximately 6.2 acres of neighborhood park (irrigated)
  - Approximately 1.4 acres of levee slope easement
  - Approximately 2.0 acres of parkland dedication south of River Islands Parkway (irrigated)
  - Approximately 0.3 acres of landscaped entries (irrigated)
  - Approximately 1.9 acres of additional lots (0.4 acres of which will be irrigated)
- There is also a remainder of 38.2 acres of undeveloped land.



Source: Mossdale Landing West Specific Plan

Figure 2-1. Project Location

2.2 Projected Water Demand

Water demand projections for buildout of the Proposed Project were developed by referencing the acreages and dwelling units used in the Vesting Tentative Map for the Proposed Project, as presented above, in combination with the water demand factors used in the Specific Plan. As presented in the Specific Plan, the low-density residential potable water demand factor of 330 gallons per day per dwelling unit (gpd/du) is from the City's 2020 UWMP. For recycled water, an application rate of 55 acre-inches per acre per year (ac-in/ac/yr) is assumed in the Specific Plan. Consistent with the Specific Plan, this WSA assumes recycled water is used to irrigate all public landscaping within the Proposed Project.

The total projected water demand for the Proposed Project is approximately 378 acre-feet per year (AFY), which includes 337 AFY of potable water and 41 AFY of recycled water, as shown in Table 2-1. All this water demand must be evaluated as part of this WSA. However, this WSA also must consider what portion of the Proposed Project was included in the City's 2020 UWMP. As shown in Section 3.4.1 of the 2020 UWMP, 658 low density dwelling units were previously planned for within the Proposed Project site. Therefore, the water demand of 243 AFY that is associated with those 658 dwelling units was already accounted for in the water supply planning within the 2020 UWMP. As shown in Table 2-1, when the 243 AFY of demand is removed, that leaves 135 AFY of water demand not previously accounted for, which must be added to the demand projections from the 2020 UWMP.

Table 2-1. Projected Water Demand for the Proposed Project

Land Use	Area, acres	Dwelling Units	Water Demand Factor (Potable) / Application Rate (Recycled)[a]	Water Demand Factor Units	Projected Water Demand, AFY
Potable Water					
Low Density Residential[b]	146.7	912	330	gpd/du	337
Recycled Water[c]					
River Islands Parkway	4.4	--	Not Irrigated	ac-in/ac/yr	0
Linear Park (Lot A)	4.8	--	55	ac-in/ac/yr	22
Neighborhood Park (Lot L)	6.2	--	55	ac-in/ac/yr	28
Levee Slope Easement (Lot B)[d]	1.4	--	Not Irrigated	ac-in/ac/yr	0
Parkland Dedication South of River Islands Parkway (Lot C)	2.0	--	55	ac-in/ac/yr	9
Landscaped Entries (Lots D & E)	0.3	--	55	ac-in/ac/yr	1
Additional Lots (Many Lots) [e]	0.4 of 1.9	--	55	ac-in/ac/yr	2
				Recycled Demand Subtotal	41
				Total Projected Demand	**378**
Water Demand Accounted for in the 2020 UWMP					
2020 UWMP Demand for the Proposed Project Area[f]		658	330	gpd/du	243
Total Incremental Additional Water Demand (Projected Demand for Proposed Project minus 2020 UWMP Demand for the Proposed Project Area)					**135**

(a) Water demand factors and application rates are from the Mossdale Landing West Specific Plan (O'Dell Engineering, 2023). Non-revenue water is not included, consistent with the Specific Plan.
(b) Includes a 10 percent buffer above the proposed 829 dwelling units for environmental review purposes.
(c) Acreages specified in Vesting Tentative Map dated February 14, 2024.
(d) The levee slope easement is assumed to not be irrigated.
(e) This includes Lots F, G, H, M, N, O, P, and Q, which total 1.9 acres. Of those, only Lots N, O, P, and Q are assumed to be irrigated, which comprises 0.4 acres.
(f) Based on planned development in the "Mossdale Landing – Other" area as described in Section 3.4.1 of the City's 2020 UWMP.
gpd/du = gallons per day per dwelling unit; ac-in/ac/yr = acre-inches per acres per year; AFY = acre-feet per year.

2.3 Projected Water Supply for the Proposed Project

Water demands for the Proposed Project, if approved by the City, will be served using the City's existing and future portfolio of water supplies discussed in Section 6.0. The inclusion of existing and planned future water supplies is specifically allows by the Water Code:

> *Water Code Section 10631(b): Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

3.0 REQUIRED DETERMINATIONS

The following sections describe the required determinations for a WSA.

3.1 Does SB 610 Apply to the Proposed Project?

10910 (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

10912 (a) "Project" means any of the following:

(1) A proposed residential development of more than 500 dwelling units.

(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.

(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

(4) A proposed hotel or motel, or both, having more than 500 rooms.

(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.

(6) A mixed-use project that includes one or more of the projects specified in this subdivision.

(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project.

As shown in Table 3-1, the Proposed Project meets the definition of a "Project" as specified in Water Code Section 10912(a), because it contains over 500 dwelling units. The Proposed Project has not been the subject of a previously adopted WSA and has not been included in an adopted WSA for a larger project. Therefore, according to Water Code section 10910(a), a WSA is required for the Proposed Project. The City has also determined that the Proposed Project is subject to CEQA and that an EIR is required. The EIR for the Proposed Project will utilize the findings of this WSA as appropriate.

Table 3-1. Does the Proposed Project Meet the SB 610 Definition of a "Project"?

SB 610 Project Definition Components	Proposed Project Quantity	Does the Proposed Project meet the SB 610 definition of a "Project"?
Residential > 500 dwelling units	912 units	YES
Retail > 1,000 employees or > 500,000 square feet	N/A	NO
Commercial Office Building > 1,000 employees or > 250,000 square feet	N/A	NO
Hotel/Motel > 500 rooms	N/A	NO
Industrial Plant/Park > 1,000 employees or > 40 acres or > 650,000 square feet	N/A	NO
Mixed Use Project that includes one or more of the above	N/A	NO
A Project that would demand the amount of water required by a 500-dwelling unit project	YES	YES
SB 610 Required?	**--**	**YES**

3.2 Does SB 221 Apply to the Proposed Project?

In 2001, SB 221 amended State law to require that approval by a city or county of certain residential subdivisions requires an affirmative written verification of sufficient water supply. Per California Government Code Section 66473.7(a)(1), a subdivision means a proposed residential development of more than 500 dwelling units. The Proposed Project, with up to 912 new residential dwelling units in the City's service area, is subject to the requirements of SB 221.

3.3 Who is the Identified Public Water System?

10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project…

10912 (c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections…

The Proposed Project area is within the City's water service area. Therefore, the City is the identified public water system for the Proposed Project.

3.4 Does the Identified Public Water System have an adopted UWMP and does the UWMP include the Projected Water Demand for the Proposed Project?

10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

10910(c)(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

According to California Water Code (CWC) Section 10617, an urban water supplier is defined as a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water per year. The City meets the definition of an urban water supplier and is therefore required to prepare an Urban Water Management Plan (UWMP). The City's most recently adopted UWMP is the 2020 UWMP, which was adopted in June 2021. The City's 2020 UWMP is incorporated by reference into this WSA.

The City's 2020 UWMP accounted for 658 low-density residential dwelling units within the Proposed Project area. However, the Proposed Project is now expected to contain 912 low-density residential dwelling units, as well as some landscaped park areas, as discussed in Section 2.2. As such, the water demand associated with the Proposed Project is only partially included in the City's 2020 UWMP.

Per Water Code Section 10910(c)(3), if the projected water demand associated with a proposed project is not accounted for in the most recently adopted UWMP, the WSA shall discuss whether water supplies are available to meet the projected water demand for that proposed project, in addition to the City's existing and planned future uses during normal, single dry, and multiple dry years. Section 8.0 and Section 9.0 of this WSA describe the City's ability to meet the projected additional incremental water demands for the Proposed Project.

4.0 CITY OF LATHROP WATER SYSTEM

The following sections describe the City's existing water service area, including existing and projected population.

4.1 Water Service Area

The City is located in San Joaquin County, California, approximately 10 miles south of the City of Stockton and directly west of the City of Manteca. The City lies east of the Coastal Range that separates California's Central Valley from the San Francisco Bay Area. Interstate 5 (I-5), a major north-south interstate corridor, bisects the City. The City is also connected by Highway 120 which runs east-west through the southeastern-most part of the City, and by Interstate 205, which connects Interstate 580 to I-5. The City encompasses approximately 13,400 acres, or about 20.9 square miles. The City's water service area is generally contiguous with the City limits.

The City currently provides water service to approximately 7,934 residential, commercial, industrial, institutional/governmental, irrigation, agricultural, and other/construction service connections. The City also provides service to a railroad cargo container commercial enterprise that is located northeast of the City limit.

4.2 Population

Although the City's water service area includes at least one connection that is outside of City limits, the City's service area population is estimated to be equivalent to the City population. As of 2020, the population estimate for the City was 26,833. Based on the anticipated development described in the City's 2020 UWMP, population projections for the City are shown in Table 4-1. The projected population in 2045 is estimated to be 95,391, a 255 percent increase over the 2020 population.

Table 4-1. City of Lathrop Service Area Existing and Projected Population

Year	2020(a)	2025	2030	2035	2040	2045(b)
Population Served	26,833	40,466	54,473	65,267	76,058	95,391

(a) Current population is based on population estimates by the California DOF for the City of Lathrop (UWMP, 2020).
(b) Data present herein for 2045 reflects conditions at buildout for planning purposes. However, the City does not anticipate all buildout development to occur before 2045.

5.0 CITY OF LATHROP WATER DEMANDS

10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f) and (g).

10910(c)(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

The descriptions provided below for the City's water demands are based on the City's 2020 UWMP and incorporate the incremental additional water demand associated with the Proposed Project where necessary.

5.1 Historical and Existing Water Demand

The City's historical water demand for 2010 through 2020 is summarized in Table 5-1. The decrease in demand in 2014 and 2015 can be attributed to mandatory statewide restrictions issued by the State Water Resources Control Board (SWRCB) during the drought and water conservation efforts by the City's residents and businesses. Since 2016, there has been in a rebound in demand. The significant increase in 2020 may be due to new development and population increases within the City, the COVID-19 stay-at-home orders, irrigation demand suppression in 2019 due to the Louise Avenue Water Treatment Facility (LAWTF) being offline, and metering efforts that underestimated demands between 2017 and 2019.

Table 5-1. City of Lathrop Current and Historical Potable Water Demand

Year	Demand, AFY
2010	3,672
2011	3,798
2012	4,332
2013	4,686
2014	4,008
2015	3,445
2016	3,646
2017	4,168
2018	4,551
2019	4,452
2020	5,485

Source: City of Lathrop 2020 UWMP, Table 4-1.

5.2 Future Normal Years Water Demand

The projected normal year water demands presented in the City's 2020 UWMP used land-use based water demand projections. Projections were based on the anticipated growth within the City's water service area. Table 5-2 presents the projected future water demands for the City during normal years, including the additional demand due to the Proposed Project as calculated in Table 2-1.

The City currently only uses recycled water for agricultural irrigation and percolation, consistent with the 2019 Recycled Water Master Plan. During 2020, the City treated 934 AF of wastewater to a tertiary level at the Lathrop Consolidated Treatment Facility (CTF), and applied 527 AF to agriculture irrigation. The City plans to begin recycled water landscape irrigation before 2025.

Table 5-2. Increase to Projected Water Demand - Normal Years, AFY

Description	2025	2030	2035	2040	2045
2020 UWMP Potable Water Demand[(a)]	7,682	9,148	10,253	11,716	14,074
2020 UWMP Recycled Water Demand[(a)]	997	1,543	2,010	2,472	2,610
Subtotal	8,679	10,691	12,263	14,188	16,684
Proposed Project Incremental Additional Water Demand[(b)]	135	135	135	135	135
Updated Normal Year Demand	**8,814**	**10,826**	**12,398**	**14,323**	**16,819**

(a) City of Lathrop 2020 UWMP Table 4-10.
(b) From Table 2-1 of this WSA.

5.3 Future Dry Years Water Demand

For planning purposes and to be conservative, the City assumes no reduction in water demand during dry years in its 2020 UWMP. The City's Water Shortage Contingency Plan (WSCP), outlined in Appendix I of the 2020 UWMP, defines six water shortage stages with associated actions to reduce water demand by up to and greater than 50 percent in the event of a water supply shortage or other emergency.

However, when evaluating future water supplies, neither the City's 2020 UWMP nor this WSA assume the City's WSCP would be implemented (which would reduce demands) during dry years. This conservative assumption means that demands in single dry years and the multiple dry year periods are equal to the normal year demands presented in Table 5-2. Table 5-3 summarizes the City's projected dry year water demands with the addition of the incremental additional demands for the Proposed Project.

Table 5-3. Increase to Projected Water Demand - Dry Years, AFY					
	2025	2030	2035	2040	2045
Single Dry Year					
2020 UWMP Potable Water Demand[a]	7,682	9,148	10,253	11,716	14,074
2020 UWMP Recycled Water Demand[a]	997	1,543	2,010	2,472	2,610
Subtotal	8,679	10,691	12,263	14,188	16,684
Proposed Project Incremental Additional Water Demand[b]	135	135	135	135	135
Updated Single Dry Year Demand	**8,814**	**10,826**	**12,398**	**14,323**	**16,819**
Multiple Dry Years					
2020 UWMP Potable Water Demand[a]	7,682	9,148	10,253	11,716	14,074
2020 UWMP Recycled Water Demand[a]	997	1,543	2,010	2,472	2,610
Subtotal	8,679	10,691	12,263	14,188	16,684
Proposed Project Incremental Additional Water Demand[b]	135	135	135	135	135
Updated Multiple Dry Year Demand	**8,814**	**10,826**	**12,398**	**14,323**	**16,819**

(a) From City of Lathrop 2020 UWMP Table 4-10.
(b) From Table 2-1 of this WSA.

6.0 CITY OF LATHROP WATER SUPPLIES

10910(d)(1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system…under the existing water supply entitlements, water rights, or water service contracts.

10910(e) If no water has been received in prior years by the public water system…under the existing water supply entitlements, water rights, or water service contracts, the public water system…shall also include in its water supply assessment…an identification of the other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system.

10910(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment.

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree… For a basin that has not been adjudicated,… information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.

The descriptions provided below for the City's water supply are based on the City's 2020 UWMP. Consistent with Water Code Section 10910(c)(3), this WSA provides an assessment of supply for the City, which will build from the supply summary presented below. That supply assessment is presented in Section 7.0 of this WSA.

The water supply for the Proposed Project will have the same water supply reliability and water quality as the water supply available to the City's other existing and future water customers. Proponents of the Proposed Project will be responsible for funding and constructing the infrastructure required to deliver water supplies to the Proposed Project area.

6.1 Water Supply Overview

The City currently receives water from two primary supply sources: (1) surface water imported from the South San Joaquin Irrigation District (SSJID) South County Water Supply Program (SCWSP), and (2) local groundwater pumped from City-owned and operated wells from the Tracy Subbasin of the San Joaquin Valley Groundwater Basin. The City also uses recycled municipal wastewater from its CTF for limited agricultural applications.

6.2 Potable Water Supply

The City obtains water from both imported surface water and local groundwater sources. The City receives Stanislaus River water through the South County Water Supply Project (SCWSP) operated by the SSJID. The City also owns and operates four active groundwater production wells. Over the period from 2016 through 2020, the City's annual potable water production ranged from 3,646 AF in 2016 to 5,485 AF in 2020.

6.2.1 Purchased or Imported Water

The City purchases imported water from SSJID through the SCWSP. Actual purchases of SCWSP water by the City have increased from 300 AF in 2016 to 3,429 AF in 2020. The SCWSP is a joint effort of SSJID and the cities of Escalon, Manteca, Lathrop, and Tracy to supply treated potable water to the participating cities. The City has entered into a Water Supply Development Agreement with SSJID for its share of the SCWSP. The Phase I and Phase II allotments for the City are 6,887 AFY and 10,671 AFY, respectively. Only Phase I is currently in place, but it is anticipated that Phase II will be implemented before 2040. Therefore, consistent with the 2020 UWMP, the water supply projections in this WSA assume Phase II of the SCWSP will be in place by 2040, increasing the City's allocation to 10,671 AFY.

6.2.2 Groundwater

Due to the relatively high cost of SCWSP water, the City has historically relied upon its groundwater wells as the primary source of supply. The subbasin and City groundwater use are described in the City's 2020 UWMP. A brief description of the subbasin and a discussion of historic and projected groundwater pumping are provided below.

6.2.2.1 Basin Description

The City overlies the Tracy Subbasin of the San Joaquin Valley Groundwater Basin (DWR 5-22). The Tracy Subbasin is not adjudicated, and it is not in a condition of critical overdraft. The City used to straddle two groundwater basins: the western portion of the City overlied the Tracy Subbasin and the eastern portion of the City overlied the Eastern San Joaquin Subbasin. Both basins are subbasins of the San Joaquin Valley Groundwater Basin and the San Joaquin River used to form the boundary between the basins. The City submitted a Basin Boundary Modification Request in June 2018 to modify the boundaries of the Eastern San Joaquin Subbasin and the Tracy Subbasin to align with Lathrop's City limits and include the entire City within the Tracy Subbasin. The Basin Boundary Modification Request was approved in February 2019 in the Final 2018 Basin Boundary Modifications, and therefore the City now only overlies the Tracy Subbasin.

Underlying the City, the groundwater surface generally slopes from south to north, with the highest groundwater elevations occurring near Yosemite Avenue east of McKinley Avenue and the lowest groundwater elevations occurring along Roth Road. There are some localized depressions due to industrial and municipal groundwater pumping operations. Groundwater elevations in the fall, after the high-use summer months, average about 3 feet lower than groundwater elevations in the spring.

The Victor formation is the uppermost formation and extends from the ground surface to a maximum depth of about 150 feet. Compared to the underlying formations, the Victor formation is generally more permeable, and the groundwater is typically unconfined. The underlying Laguna formation includes discontinuous lenses of unconsolidated to semi-consolidated sands and silts interspersed with lesser amounts of clay and gravel. The Laguna formation is hydraulically connected to the Victor formation and is estimated to be 750 to 1,000 feet thick. Moderate permeability has been reported within the Laguna formation with some highly permeable coarse-grained beds. Most of the municipal and industrial wells in the Lathrop area penetrate through the Victor formation into the Laguna formation.

Most of the fresh groundwater is encountered at depths of less than 1,000 feet, and most of this shallow groundwater is unconfined.

6.2.2.2 Basin Management

In 2014, the California legislature enacted the Sustainable Groundwater Management Act (SGMA) in response to continued overdraft of California's groundwater resources. The Tracy Subbasin has not been identified as in overdraft, nor is it expected to be in overdraft. The Tracy Subbasin has also not been adjudicated. Adjudication is defined as an action filed in the superior or federal district court to determine the rights to extract groundwater from a basin or store water within a basin, including, but not limited to, actions to quiet title respecting rights to extract or store groundwater or an action brought to impose physical solution on a basin.

The Tracy Subbasin is designated as a medium priority basin, and therefore subject to the requirements of SGMA. There are six Groundwater Sustainability Agencies (GSAs) formed in the Tracy Subbasin, collectively managing the subbasin, including the City. The six GSAs are:

- Banta-Carbona Irrigation District
- Byron-Bethany Irrigation District
- City of Lathrop
- City of Tracy
- San Joaquin County
- Stewart Tract

A single collaborative Groundwater Sustainability Plan (GSP) was submitted to the DWR in January 2022 and serves as a guide for the sustainable management of the Tracy Subbasin.

6.2.2.3 Existing and Future Use

As described in the City's 2020 UWMP, groundwater pumping decreased from 3,346 AF in 2016 to 1,560 AF in 2019, due to groundwater quality concerns. The City resumed most of its historic groundwater production in 2021. The City's 2020 UWMP assumes the wells are pumped at 50 percent of their maximum capacity on an annual basis and estimates annual groundwater supply to be approximately 4,720 AFY.

The Tracy Subbasin GSP has not affected the City's ability to utilize its groundwater wells. Therefore, it is assumed that 100 percent of the estimated groundwater capacity is available for future use.

6.3 Recycled Water Supply

The City is the sole agency responsible for water, wastewater, groundwater, and planning within the City's service area. Wastewater from the City is treated at two facilities: the regional Manteca Wastewater Quality Control Facility (MWQCF) and the CTF. The City owns 14.7 percent of the MWQCF capacity by contract with the City of Manteca, however, the City does not participate in the operation of the plant, nor does it receive recycled water from the MWQCF.

Tertiary effluent from the Lathrop CTF is currently conveyed through the recycled water system to storage ponds and sprayfields, where the recycled water is used for agricultural irrigation of fodder crops. The system consists of the CTF, six booster pump stations, storage pond capacity of approximately 289 MG, and approximately 30.3 miles of distribution pipelines. As of 2020, the City treated 934 AF of wastewater to a tertiary level suitable for irrigation at parks, landscape strips, median islands, pond berms, and agricultural fields. As discussed in Section 5.2, the treated effluent is only used for agricultural irrigation and percolation.

The City is currently pursuing a National Pollutant Discharge Elimination System (NPDES) permit to expand the treatment capacity of the CTF and begin providing recycled water for landscape irrigation and other non-potable uses, anticipated to begin before 2025.

The City's 2020 UWMP assumed the recycled water supply projection to be the same as the projected recycled water demand.

6.4 Summary of Existing and Additional Planned Future Water Supplies

Table 6-1 summarizes the projected normal year water supply through 2045 as presented in the City's 2020 UWMP. The availability and reliability of the City's supplies in dry years is discussed in Section 7.0 of this WSA. As discussed above, recycled water supply is anticipated to increase following expansion of the CTF and the surface water allocation available to the City is expected to increase starting in 2040 with implementation of Phase II of the SCWSP. There are currently no plans for expansion of groundwater supply.

Table 6-1. Existing and Projected Water Supplies

Water Supply	Detail	Actual Volume[a]	Reasonably Available Volume, AF[b]				
		2020	2025	2030	2035	2040	2045
Purchased or Imported Water	SSJID SCWSP Phase I	3,429	6,887	6,887	6,887	6,887	6,887
	SSJID SCWSP Phase II	-	-	-	-	3,784	3,784
Groundwater	-	2,055	4,720	4,720	4,720	4,720	4,720
Recycled Water	-	527	997	1,543	2,010	2,472	2,610
Total Available Supply		**6,011**	**12,604**	**13,150**	**13,617**	**17,863**	**18,001**

(a) City of Lathrop 2020 UWMP Table 6-10.
(b) City of Lathrop 2020 UWMP Table 6-11.

7.0 WATER SUPPLY RELIABILITY

10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

10911(a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. If the city or county, if either is required to comply with this part pursuant to subdivision (b), concludes as a result of its assessment, that water supplies are, or will be, insufficient, the city or county shall include in its water supply assessment its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. Those plans may include, but are not limited to, information concerning all of the following:

(1) The estimated total costs, and the proposed method of financing the costs, associated with acquiring the additional water supplies.

(2) All federal, state, and local permits, approvals, or entitlements that are anticipated to be required in order to acquire and develop the additional water supplies.

(3) Based on the consideration set forth in paragraphs (1) and (2), the estimated timeframes within which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), expects to able to acquire additional water supplies.

Water Code Section 10910 (c)(4) requires that a WSA include a discussion with regard to “whether total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.” Accordingly, this WSA addresses these three hydrologic conditions through the year 2045. The reliability discussion presented in this section reflects Chapter 7 of the City’s 2020 UWMP.

7.1 SCWSP Reliability

The SCWSP supply is based on SSJID’s senior, pre-1914 appropriative water rights to the Stanislaus River, coupled with an agreement with the United States Bureau of Reclamation (USBR) to store water in the New Melones Reservoir. Due to the seniority of the water rights, the City has historically assigned a high reliability to SCWSP water. However, in December 2018, the SWRCB released amendments to the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The adopted amendment included significant changes and could result in significant surface water cutbacks. The following sections describe the potential impacts of the Bay-Delta Plan Amendment on SCWSP reliability and allocation of SCWSP supplies during supply shortages.

7.1.1 Potential Impacts of the 2018 Bay-Delta Plan Amendment on SCWSP Reliability

The Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 40 percent of the “unimpaired flow” on the three tributaries from February through June in every year type, whether wet, normal, dry, or critically dry.

As of the time of this WSA, implementation of the Bay-Delta Plan Amendment remains uncertain. The City's 2020 UWMP presented a water reliability analysis assuming the Bay-Delta Plan Amendment would not be implemented, which was based on supply reliability information provided by SSJID. To be consistent with the analysis conducted in the 2020 UWMP, this WSA also assumes that the Bay-Delta Plan Amendment is not implemented. SSJID anticipates that 100 percent of the contract volumes will be available to SCWSP participants in normal years. In single dry years, participants are projected to receive 79 percent to 99 percent of their contract volumes. In five-year multiple dry year scenarios, SSJID projects that SCWSP participants will receive 79 percent to 99 percent of their contract volumes during the third and fourth dry years, while 100 percent of the contract volume will be available in the remaining years. SSJID provided the following rationale for this approach:

> *Over a dozen lawsuits have been filed in both state and federal courts, including challenges filed by the Oakdale Irrigation District and SSJID, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment are in the early stages and there have been no consequential court rulings as of this date. Secondly, the Bay-Delta Plan Amendment did not include an allocation of responsibility for meeting the flow requirements. Such an allocation of responsibility must consider the senior water rights of both OID and SSJID who have adjudicated pre-1914 rights and other senior appropriative rights. In recognition of the difficult legal process ahead, many stakeholders throughout California including the State and Federal Government have opted to explore the possibility of voluntary agreements to achieve outcomes comparable to those described in the Bay-Delta Amendment balancing the needs of all water users. Both OID and SSJID have participated in voluntary agreement negotiations. Based on these uncertainties, SSJID has opted to make no near-term planning assumptions related to the implementation of the Bay-Delta Plan Amendment for the purposes of this 2020 UWMP. Should conditions change or consequential resolution of the issues aforementioned come to be, SSJID will revise and re-adopt a 2020 UWMP to reflect changes to its impacted water supply.*

The City's 2020 UWMP assumed supply availability will be proportionate to the SCWSP supply availability and presented a water reliability analysis reflecting SSJID's analysis. To assess the impacts of the Bay-Delta Plan Amendment and identify potential shortfalls in the event that it is implemented, the City also conducted a supporting parallel supply analysis, presented in Appendix H of the 2020 UWMP.

7.2 Groundwater

The City currently relies upon groundwater production from its four active wells (Wells 6, 7, 8, and 10) to meet demands. As discussed in Section 6.2.2.3, the City is not required by the Tracy Subbasin GSP to limit groundwater production to achieve sustainability. The City's production has historically been constrained by well production, treatment capacity, and groundwater quality. The City has a goal of providing treatment to bring their inactive well (Well 9) online to increase groundwater yield. The City is also evaluating projects that could provide additional groundwater supply reliability.

Water quality is one of the biggest threats to the City's groundwater supply reliability. The primary water quality concerns in the groundwater supply are arsenic, manganese, uranium, nitrate, total dissolved solids (TDS), contamination from industrial processes, and per- and polyfluoroalkyl substances (PFAS).

7.2.1 Arsenic and Uranium

All four active wells are currently treated for arsenic at the LAWTF to reduce concentrations below the Maximum Contaminant Level (MCL) of 0.010 milligrams per liter (mg/L). The City's Well 21 also experienced elevated concentrations of arsenic and uranium and is currently projected to remain inactive.

7.2.2 Total Dissolved Solids

Groundwater supply reliability is also impacted by the potential to induce migration of groundwater with TDS concentrations in excess of the Secondary MCL of 500 mg/L.

7.2.3 Industrial Contamination

Groundwater contamination has been identified at several locations in the City due to industrial processes. Contamination plumes are associated with pollution from Sharpe Army Depot and the former Occidental Chemical Corporation (OCC) site.

Contamination of groundwater at the Sharpe Army Depot consists primarily of trichloroethene, tetrachloroethene, and cis-1,2-dichloroethene. The plume is located at depths of approximately 50 to 150 feet below ground surface (ft bgs). Three groundwater extraction and treatment systems located at Sharpe Army Depot are used to treat existing groundwater contamination.

The OCC plume consists primarily of the pesticides 1,2-dibromo-3-chloropropane (DBCP) and ethylene dibromide (EDB), and the chemical solvent sulfolane. The OCC has been conducting investigation and remediation activities at the site since 1979, and a groundwater remedial system has been in place since 1982. The groundwater remedial system consists of extraction and injection wells as well as granular activated carbon and aeration treatment. Treated water is then re-injected into the confined aquifer beneath the Corcoran Clay layer, which is located between 230 and 300 ft bgs.

To help prevent a sulfolane containment plume originating from the former OCC site from impacting the City's groundwater supply, the City temporarily reduced its groundwater production and significantly limited groundwater production between 2018 and 2020. Efforts to improve the OCC groundwater extraction and treatment system were completed in March 2020. The City restarted the four active wells and the LAWTF in April of 2020.

7.2.4 Nitrate

Nitrate concentrations detected at Well 10 have recently shown increasing trends. During April and November 2020, nitrate (as nitrogen) at Well 10 was detected at 8.1 mg/L and 7.5 mg/L, respectively, approaching the MCL of 10 mg/L. The City is closely monitoring for nitrate in Well 10 at least once per quarter and evaluating the possible contaminant source.

7.2.5 Per- and Polyfluoroalkyl Substances

PFAS is a group of emerging man-made contaminants that were used in firefighting foam, protective coatings, and stain and water-resistant products until the 2000s. As described in the City's 2020 UWMP, the regulatory setting for PFAS was as follows:

- The United States Environmental Protection Agency (USEPA) established a lifetime health advisory for the two most common PFAS compounds, Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS), at a combined 70 nanograms per liter (ng/L). USEPA is moving forward with the enforceable MCL process for PFOA and PFOS. In February 2020, USEPA announced it was initiating a two-year period for the agency to formally propose MCLs for PFOA and PFOS. Once MCLs are formally proposed, the agency has another 18 months to finalize its drinking water requirements. The USEPA is also gathering and evaluating information to determine if regulation is appropriate for additional individual PFAS.

- The SWRCB Division of Drinking Water (DDW) established drinking water Notification Levels (NLs) and Response Levels (RLs) for PFOA and PFAS. Under the authority of Health and Safety Code section 116400, detections above the NL require agencies to notify the governing body for the areas where the water has been served within 30 days of receiving verified test results. If the RL is exceeded in drinking water provided to consumers, DDW recommends that the water agency remove the water source from service or provide treatment.

A series of sampling events in the City's production wells during 2019 and 2020 showed that PFOA and PFOS concentrations in groundwater from Well 9 exceeding both the NLs and RLs. The NLs for PFOS were also exceeded in one or more samples collected from Wells 6, 7, 8, and 10. PFOA concentrations in groundwater from Wells 6, 7, 8, and 10 were below reporting limits. Based on these and historical sampling results, the City took Well 9 offline so that the PFOA concentrations in the blended flow from remaining wells is well below the RLs.

In early 2024, new PFAS regulations were passed in California and at the Federal level:

- On April 5, 2024, the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency adopted and published Public Health Goals (PHGs) for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) in drinking water. A PHG is the level of a drinking water contaminant at which adverse health effects are not expected to occur from a lifetime of exposure. The PHG for PFOA was set at 0.007 parts per trillion (ppt) and the PHG for PFOS was set at 1 ppt.
- On April 10, 2024, the USEPA announced the final National Primary Drinking Water Regulation for six PFAS compounds. Public water systems must monitor for these PFAS compounds and have three years to complete initial monitoring (by 2027), followed by ongoing compliance monitoring. Water systems must also provide the public with information on the levels of these PFAS compounds in their drinking water beginning in 2027. Public water systems have five years (by 2029) to implement solutions that reduce these PFAS compounds if monitoring shows that drinking water levels exceed the MCLs. Beginning in five years (2029), public water systems that have PFAS in drinking water which violates one or more of the MCLs must take action to reduce levels of these PFAS compounds in their drinking water and must provide notification to the public of the violation.

The abovementioned water quality issues impact the reliability of the City's groundwater supply. Expansion of groundwater production in the future is limited by the costs associated with treatment and the availability of adequate supplies to conduct blending. Given the above issues, the City is not currently pursuing development of any additional wells or increased groundwater production.

7.3 Recycled Water

Recycled water is assumed to be a reliable and stable water supply source and is estimated to be 100 percent reliable and available during all hydrologic years at a volume that meets the City's projected recycled water demands.

7.4 Summary of Available Water Supplies Under Normal, Single Dry, and Multiple Dry Years

The reliability of the City's water supplies and their projected availability during normal, single dry, and multiple dry years, as described in Chapter 7 of the 2020 UWMP, is summarized in Table 7-1 below.

Table 7-1. Availability and Reliability of Water Supplies

Hydrologic Condition	Supply Amount, AF				
	2025	2030	2035	2040	2045
Normal Years[a]	12,604	13,150	13,617	17,863	18,001
Single Dry Years[b]	11,495	12,591	13,607	15,609	16,369
Multiple-Dry Years 1st Year[c]	12,604	13,150	13,617	17,863	18,001
Multiple-Dry Years 2nd Year[c]	12,604	13,150	13,617	17,863	18,001
Multiple-Dry Years 3rd Year[c]	11,495	12,591	13,607	15,609	16,369
Multiple-Dry Years 4th Year[c]	11,495	12,591	13,607	15,609	16,369
Multiple-Dry Years 5th Year[c]	12,604	13,150	13,617	17,863	18,001

(a) City of Lathrop 2020 UWMP Tables 7-2 and 7-6.
(b) City of Lathrop 2020 UWMP Table 7-4.
(c) City of Lathrop 2020 UWMP Table 7-5.

8.0 DETERMINATION OF WATER SUPPLY SUFFICIENCY BASED ON THE REQUIREMENTS OF SB 610

10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

10911 (a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies.

Due to the uncertainties surrounding the implementation of the Bay-Delta Plan Amendment, this WSA presents its findings assuming the Bay-Delta Plan is not implemented, consistent with the 2020 UWMP.

Table 8-1 summarizes the projected availability of the City's existing and planned future potable water supplies compared with projected water demands, including the Proposed Project, in normal, single dry, and multiple dry years through buildout. As shown in Table 8-1, the total projected water supplies determined to be available in normal years will meet the City's existing and planned future uses, including those associated with the Proposed Project through 2040. However, supply shortfalls of 3 percent (450 AF) are projected to occur in 2045 for single dry years and the third and fourth years of a multiple dry year period.

Table 8-1. Summary of City of Lathrop Water Demand Versus Water Supply During Various Hydrologic Conditions

Hydrologic Condition		Supply Amount, AF 2025	2030	2035	2040	2045
Normal Years						
Available Water Supply[(a)]		12,604	13,150	13,617	17,863	18,001
2020 UWMP Demand[(a)]		8,679	10,691	12,263	14,188	16,684
Proposed Project Additional Demand[(b)]		135	135	135	135	135
Updated Water Demand		*8,814*	*10,826*	*12,398*	*14,323*	*16,819*
Potential Surplus (Deficit)		**3,790**	**2,324**	**1,219**	**3,540**	**1,182**
Percent Shortfall of Demand		**--**	**--**	**--**	**--**	**--**
Single Dry Years Years						
Available Water Supply[(a)]		11,495	12,591	13,607	15,609	16,369
2020 UWMP Demand[(a)]		8,679	10,691	12,263	14,188	16,684
Proposed Project Additional Demand[(b)]		135	135	135	135	135
Updated Water Demand		*8,814*	*10,826*	*12,398*	*14,323*	*16,819*
Potential Surplus (Deficit)		**2,681**	**1,765**	**1,209**	**1,286**	**(450)**
Percent Shortfall of Demand		**--**	**--**	**--**	**--**	**3%**
Multiple Dry Years						
Multiple Dry Year 1	Available Water Supply[(a)]	12,604	13,150	13,617	17,863	18,001
	2020 UWMP Demand[(a)]	8,679	10,691	12,263	14,188	16,684
	Proposed Project Additional Demand[(b)]	135	135	135	135	135
	Updated Water Demand	*8,814*	*10,826*	*12,398*	*14,323*	*16,819*
	Potential Surplus (Deficit)	**3,790**	**2,324**	**1,219**	**3,540**	**1,182**
	Percent Shortfall of Demand	**--**	**--**	**--**	**--**	**--**
Multiple Dry Year 2	Available Water Supply[(a)]	12,604	13,150	13,617	17,863	18,001
	2020 UWMP Demand[(a)]	8,679	10,691	12,263	14,188	16,684
	Proposed Project Additional Demand[(b)]	135	135	135	135	135
	Updated Water Demand	*8,814*	*10,826*	*12,398*	*14,323*	*16,819*
	Potential Surplus (Deficit)	**3,790**	**2,324**	**1,219**	**3,540**	**1,182**
	Percent Shortfall of Demand	**--**	**--**	**--**	**--**	**--**
Multiple Dry Year 3	Available Water Supply[(a)]	11,495	12,591	13,607	15,609	16,369
	2020 UWMP Demand[(a)]	8,679	10,691	12,263	14,188	16,684
	Proposed Project Additional Demand[(b)]	135	135	135	135	135
	Updated Water Demand	*8,814*	*10,826*	*12,398*	*14,323*	*16,819*
	Potential Surplus (Deficit)	**2,681**	**1,765**	**1,209**	**1,286**	**(450)**
	Percent Shortfall of Demand	**--**	**--**	**--**	**--**	**3%**
Multiple Dry Year 4	Available Water Supply[(a)]	11,495	12,591	13,607	15,609	16,369
	2020 UWMP Demand[(a)]	8,679	10,691	12,263	14,188	16,684
	Proposed Project Additional Demand[(b)]	135	135	135	135	135
	Updated Water Demand	*8,814*	*10,826*	*12,398*	*14,323*	*16,819*
	Potential Surplus (Deficit)	**2,681**	**1,765**	**1,209**	**1,286**	**(450)**
	Percent Shortfall of Demand	**--**	**--**	**--**	**--**	**3%**
Multiple Dry Year 5	Available Water Supply[(a)]	12,604	13,150	13,617	17,863	18,001
	2020 UWMP Demand[(a)]	8,679	10,691	12,263	14,188	16,684
	Proposed Project Additional Demand[(b)]	135	135	135	135	135
	Updated Water Demand	*8,814*	*10,826*	*12,398*	*14,323*	*16,819*
	Potential Surplus (Deficit)	**3,790**	**2,324**	**1,219**	**3,540**	**1,182**
	Percent Shortfall of Demand	**--**	**--**	**--**	**--**	**--**

(a) From City of Lathrop 2020 UWMP Tables 7-7, 7-8 and 7-9.

(b) From Table 2-1 of this WSA.

If supply shortfalls do occur, the City expects to meet these supply shortfalls through water demand reductions and other shortage response actions by implementing its WSCP, which can be enacted upon City Council declaration. Section 9.3 of this WSA provides further detail on the City's WSCP. The City has also developed strategies and actions to minimize the potential for water supply shortfalls to occur.

As discussed in Section 6.3, the City is developing a recycled water program that will support the use of recycled water to irrigate public landscaping by 2025, which will offset potable water demand for irrigation purposes within the City. If additional recycled water is made available, the potable water demands will be less than the current projections and therefore the resultant supply shortage will likely be smaller.

In addition, the City has been implementing, and plans to continue to implement, demand management measures. These consist of:

- Water waste prevention ordinances
- Metering
- Conservation pricing
- Public education and outreach
- Programs to assess and manage distribution system real loss
- Water conservation program coordination and staffing support
- Other management measures

The City is also evaluating water supply options that could bolster the City's dry year supply reliability, such as additional groundwater treatment, aquifer storage and recovery, indirect potable reuse, as well as support for implementation of SCWSP Phase II or other reliability projects.

9.0 VERIFICATION OF WATER SUPPLY SUFFICIENCY BASED ON THE REQUIREMENTS OF SB 221

The Proposed Project may also be subject to the requirements of SB 221 (Government Code section 66473.7). SB 221 applies to residential development projects of more than 500 dwelling units and requires that the water supplier provide a written verification that the water supply for the Proposed Project is sufficient. As previously discussed, the Proposed Project includes 912 new residential dwelling units within the City's service area.

Verification must demonstrate supply sufficiency by showing that water supplies available during normal, single dry and multiple dry years within a projected 20-year period will meet the projected demand associated with the Proposed Project, in addition to existing and planned future uses, including, but not limited to, agriculture and industrial uses. Per the requirements of SB 221, the following must be considered:

- Historical water deliveries for the previous 20 years
- Supply reduction for specific water use sectors
- Urban water shortage contingency analysis prepared for the UWMP
- Amount of water expected from specified supply projects

The specific considerations to be evaluated for the SB 221 verification are described below and reference applicable sections of the City's 2020 UWMP and this WSA.

9.1 Historical Water Deliveries

Table 9-1 presents a summary of the City's historical water supplies. Additional information about the City's historical and current water supplies is presented in Section 6.0 of this WSA and described in detail in Chapter 6 of the 2020 UWMP. The use of these water supplies is expected to vary in the future, as described in Section 6.0 of this WSA. The availability and reliability of these water supplies during normal, single dry, and multiple dry years is summarized in Section 7.0 of this WSA and described in detail in Chapter 7 of the 2020 UWMP.

Table 9-1. City of Lathrop's Historical Water Supplies

Water Source	Historical Water Supply, AF[(a)]				
	2016	2017	2018	2019	2020
SSJID SCWSP	300	921	1,946	2,893	3,429
Groundwater	3,346	3,247	2,605	1,560	2,055
Recycled Water	450	534	402	472	527
Total	**4,096**	**4,702**	**4,953**	**4,925**	**6,011**

(a) City of Lathrop 2020 UWMP Table 6-10

9.2 Projected Water Demand by Customer Sector

Projected potable and recycled water demands in the City's service area are described in Section 5.0 of this WSA, and additional information is provided in Chapter 4 of the 2020 UWMP. Projected potable water demand by customer sector within the City's service area is documented in Chapter 4 of the 2020 UWMP and is summarized in Table 9-2, with the Proposed Project added.

Table 9-2. Actual and Projected Potable Water Demands

Water Use Type	Water Demand, AF					
	2020(c) (Actual)	2025(d)	2030(d)	2035(d)	2040(d)	2045(d)
Single Family	2,559	3,807	4,810	5,498	6,186	7,987
Multi-Family	99	172	383	594	805	839
Commercial	189	593	734	859	1,048	1,152
Industrial	1,171	1,854	1,854	1,854	2,101	2,197
Institutional/ Governmental	128	445	454	463	471	563
Irrigation	870	196	224	242	288	401
Agricultural(a)	1	-	-	-	-	-
Other/Construction	171	-	-	-	-	-
Losses(b)	297	615	688	743	817	934
Demand Subtotal	5,485	7,682	9,147	10,253	11,716	14,073
Proposed Project Additional Demand(e)	135	135	135	135	135	135
Total Demand	**5,620**	**7,817**	**9,282**	**10,383**	**11,851**	**14,208**

(a) The single agricultural customer will be replaced by a development.
(b) Losses represent all non-revenue water.
(c) From City of Lathrop 2020 UWMP Table 4-2.
(d) From City of Lathrop 2020 UWMP Table 4-5.
(e) From Table 2-1 of this WSA.

9.3 Water Shortage Contingency Analysis

The City's WSCP, included as an appendix to the City's 2020 UWMP, describes the City's strategic plan in preparation for and response to water shortages. It includes water shortage stages and associated actions that will be implemented in the event of a water supply shortage, including situations when catastrophic water supply interruptions occur due to a regional power outage, earthquake, or other disaster; and when drought occurs. The plan is based on Lathrop Municipal Code Section 13.08, which contains provisions related to water conservation and rationing.

The primary objective of the WSCP is to ensure that the City has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. Consistent with Water Code Section 10632, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent, identifies a suite of demand mitigation measures for the City to implement at each level, and identifies procedures for the City to annually assess whether or not a water shortage is likely to occur in the coming year, among other things.

If an emergency or drought condition were to occur that requires the City to implement its WSCP, all City customers, include those within the Proposed Project, would be subject to the same water conservation and water use restrictions included in the 2020 WSCP.

9.4 Verification of Sufficient Water Supply

As described in Section 8.0 of this WSA, the total projected water supplies determined to be available for the Proposed Project during normal, single dry, and multiple dry years during a 20-year projection will not consistently meet the projected water demand associated with the Proposed Project, in addition to existing and planned future uses. With the Proposed Project, the City is projected to have adequate supplies to meet projected demands in all year types through 2040, but would experience up to a 3 percent shortfall (450 AF) in 2045 in single dry years and the third and fourth years of a multiple dry year period. As described in Section 8.0, the City has developed a number of strategies and actions to minimize the potential for water supply shortfalls.

10.0 WATER SUPPLY ASSESSMENT APPROVAL PROCESS

> *10910 (g)(1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.*

As the approving agency for the Proposed Project, the City must adopt this WSA at a regular or special meeting. Furthermore, the City must include this WSA in the EIR being prepared for the Proposed Project.

11.0 REFERENCES

De Novo Planning Group. August 2022. *General Plan: City of Lathrop.*

De Novo Planning Group. March 2024. *Notice of Preparation and Initial Study for the Mossdale Landing West Specific Plan.*

EKI. December 2018. *City of Lathrop Water System Master Plan.*

EKI. June 2021. *2020 Urban Water Management Plan for City of Lathrop.*

O'Dell Engineering. November 2023. *Mossdale Landing West Specific Plan.*

O'Dell Engineering. February 2024. *Mossdale Landing West Vesting Tentative Map, Lathrop, California.*

APPENDIX G

Hydraulic Evaluation

28 February 2024

MEMORANDUM

To: Brad Taylor (City of Lathrop)
Greg Gibson (City of Lathrop)

From: Jonathan Sutter, P.E. (EKI)
Tina Wang, P.E. (EKI)
Chris Pittner, P.E. (EKI)
Yuqing Gao (EKI)

Subject: Hydraulic Evaluation for the Mossdale Landing West Development
City of Lathrop
(EKI C20049.06)

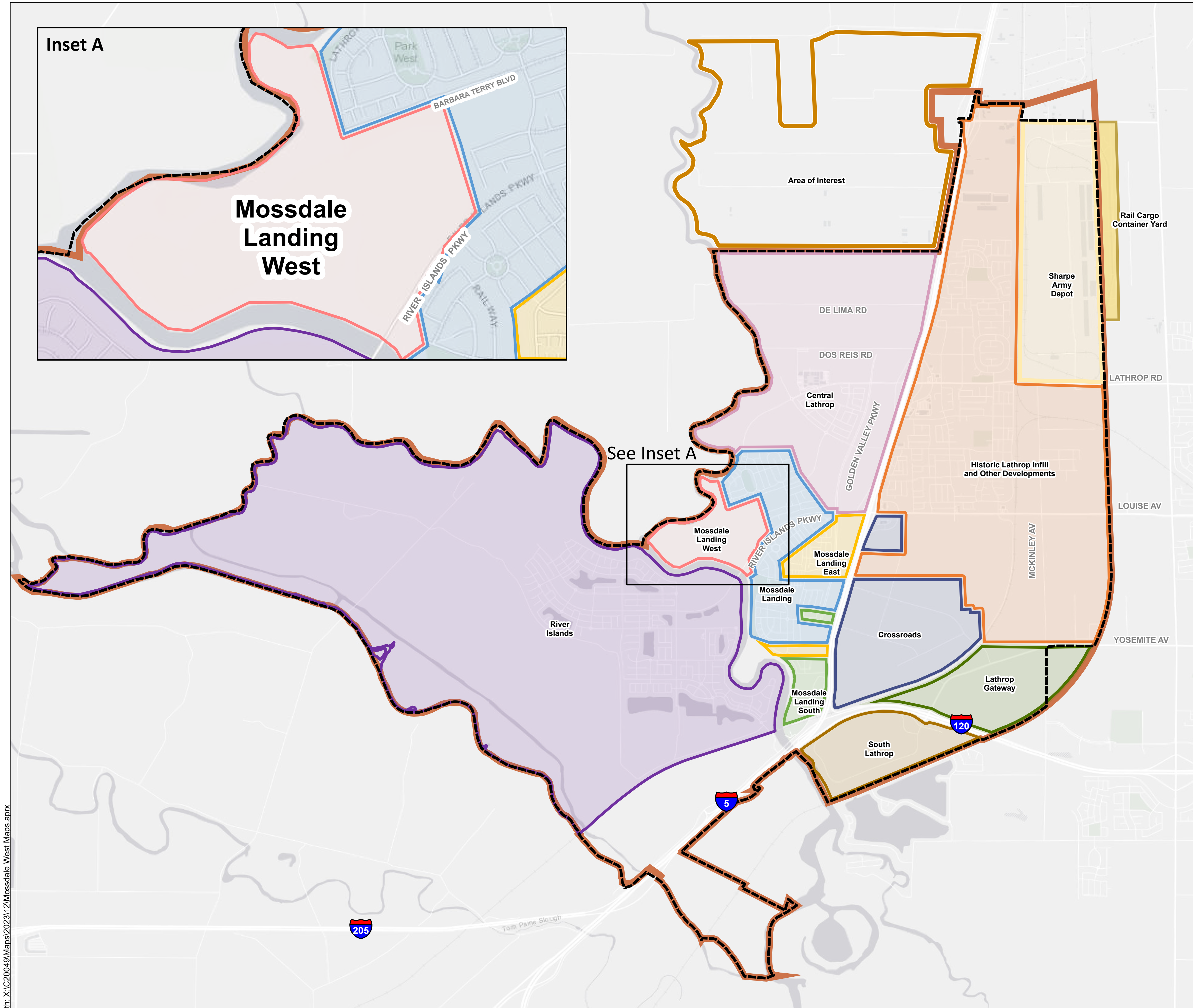
EKI Environment & Water Inc. (EKI) is pleased to present to City of Lathrop (City) this technical memorandum (TM) that evaluates the City's potable water, wastewater, and recycled water systems' capacities to support the Mossdale Landing West development (Project). This memorandum evaluates the system needs to provide water, wastewater, recycled water services to the Project, including demand and flow projections, storage and capacity needs, and any necessary system improvements. However, it should be noted that the water demand and supply evaluation presented herein does not constitute a water supply assessment per Senate Bill 610.

The analyses presented herein were conducted concurrently with and under the same assumptions as the City's draft 2024 Integrated Water Resources Master Plan (IWRMP) Amendment. Hydraulic modeling was performed as part of these analyses both with and without the Project under the City's buildout conditions to evaluate each system's ability to serve the Project.[1] The results of this evaluation will be incorporated into the City's IWRMP Amendment.

PROJECT DESCRIPTION

The Project is a recently proposed development located northwest of River Islands Parkway and south of Barbara Terry Boulevard (APN 191-190-01), as shown on Figure 1. The Project's proposed development and planned infrastructure are included in the Mossdale Landing West Vesting Tentative Map, dated 14 February 2024 (Attachment A). The Project includes approximately 829 planned residential units and 11 acres of parks and landscape area. Project buildout is anticipated by 2032.[2]

[1] Buildout of the City's current development projections are anticipated by 2045. EKI also performed modeling with the Project under existing conditions to confirm that ability for the system to serve the project was not contingent upon planned infrastructure that may not be been built before the Project buildout.
[2] Information provided by the City on 20 April 2023 and 14 November 2023 through email exchange.



Legend

- City Limit
- Sphere of Influence
- Area of Interest
- Rail Cargo Container Yard

Development Areas

- Central Lathrop
- Crossroads
- Historic Lathrop Infill and Other Developments
- Lathrop Gateway
- Mossdale Landing
- Mossdale Landing West
- Mossdale Landing East
- Mossdale Landing South
- River Islands
- Sharpe Army Depot
- South Lathrop

Notes
1. All locations are approximate.

Sources
1. Aerial photograph provided by ESRI's ArcGIS Online, 16 January 2024.

N

0 4,000 8,000
(Scale in Feet)

Project Location

Hydraulic Evaluation for Mossdale Landing West Development
City of Lathrop
Lathrop, CA
February 2024
C20049.06

eki environment & water

Figure 1

Path: X:\C20049\Maps\2023\12\Mossdale West Maps.aprx

PROJECTED WATER DEMANDS AND WASTEWATER FLOW

As shown in Table 1, the Project's estimated water demands and wastewater flows were calculated by multiplying the proposed dwelling units and acreages by the City's 2024 updated demand factors; recycled water demand are estimated as the irrigation demand of the Project's park and landscape acreage under average hydrologic year conditions.

Table 1. Estimated Project Demand

Land Use	Proposed Dwelling Units / Acres (a)	Demand or Flow Factor (b)	Estimated Demand or Flow
Potable Water			
Low Density Residential	829	330 gpd/ac	273,570 gpd
		Average Day Demand	273,570 gpd
			306 AFY
Wastewater			
Low Density Residential	829	240 gpd/ac	198,960 gpd
Park	11	55 gpd/ac	603 gpd
		Average Dry Weather Flow	199,563 gpd
			0.20 MGD
Recycled Water			
Park	11	3,625 gpd/ac (c)	39,875 gpd
		Average Day Demand	39,875 gpd
			44.67 AFY

Abbreviations
ac = acres gpd = gallons per day AFY = acre-feet per year MGD = million gallons per day

Note
(a) Information obtained from the Mossdale Landing West Vesting Tentative Map by O'Dell, dated July 21, 2023.
(b) City of Lathrop draft 2024 IWRMP Amendment demand factors.
(c) An approximate demand factor calculated based on the recycled water balance analysis.

WATER SYSTEM EVALUATION

The water system evaluation presented herein includes (1) a potable water supply and demand assessment, (2) a distribution system hydraulic capacity evaluation conducted using the City's hydraulic model, and (3) water system supply, storage, and pump capacity evaluations.

Potable Water Supply and Demand Assessment

This section compares the City's projected potable water demand including the Project to the potable water supplies available during normal years, single dry years, and multiple dry year types. The City's groundwater supply is anticipated to be 100% reliable under all year types, while imported water supplies from South County Water Supply Program (SCWSP) vary between 79% to 100% of City's contract volume.[3]

The City's water supply and demand assessment inclusive of the project are presented in Table 2 in five-year increments through 2045.

As shown in Table 2, the City is projected to have sufficient supplies to meet projected demands in normal years, single dry years, and multiple dry years through buildout. However, it should be noted that the water demand and supply evaluation presented herein does not constitute a water supply assessment per Senate Bill 610 and a separate water supply assessment may be required by the City.

Table 2. Projected Potable Water Supply and Demand During Different Year Types

	Estimated Potable Water Supply and Demand (AFY) (a)				
	2025	**2030**	**2035**	**2040**	**2045**
Projected Demand					
City Potable Water Demand w/o Project	6,128	8,280	9,838	11,321	12,099
Proposed Project	--	--	306	306	306
Potable Water Demand Inclusive of Project	6,128	8,280	10,144	11,627	12,405
Projected Supply and Shortfall					
Normal Year Supply	12,107	12,107	15,981	15,981	15,981
Percent Shortfall Inclusive of Project	--	--	--	--	--
Single Dry Year Supply	10,998	11,548	12,097	13,637	14,259
Percent Shortfall Inclusive of Project	--	--	--	--	--
Multiple Dry Year Supply (First Year)	12,107	12,107	15,981	15,981	15,981
Percent Shortfall Inclusive of Project	--	--	--	--	--
Multiple Dry Year Supply (Second Year)	12,107	12,107	15,981	15,981	15,981
Percent Shortfall Inclusive of Project	--	--	--	--	--
Multiple Dry Year Supply (Third Year)	10,998	11,548	12,097	13,637	14,259
Percent Shortfall Inclusive of Project	--	--	--	--	--
Multiple Dry Year Supply (Fourth Year)	10,998	11,548	12,097	13,637	14,259
Percent Shortfall Inclusive of Project	--	--	--	--	--
Multiple Dry Year Supply (Fifth Year)	12,107	12,107	15,981	15,981	15,981
Percent Shortfall Inclusive of Project	--	--	--	--	--

Notes:
(a) Reliability of the City's water supplies are obtained from the draft 2024 IWRMP Amendment.

[3] Reliability of the City's supplies are based on the City's 2020 UWMP and that Well 9 will be brought online before 2026 at 500 AFY, consistent with assumptions in the draft 2023 IWRMP Amendment. The City's 2020 UWMP is available at: https://www.ci.lathrop.ca.us/sites/default/files/fileattachments/public_works/page/1681/uwmp_2020_-_lathrop_w_appendices.pdf

Hydraulic Model Update and Assumptions

The water system hydraulic evaluation is conducted using the City's potable water hydraulic model, which has been updated as part of the 2024 amendment to the City's IWRMP and incorporates:

- Improvements to the City-wide water distribution facilities, including pipes, wells, tanks, and booster pump stations (BPSs) as of December 2023 (Figure 2).
- Pump station settings as of September 2023.[4]
- City-wide potable water demands at buildout based on the City's 2022 water consumption data and development projections post 2022.[5]

Mossdale Landing West Water Distribution System

In addition, EKI updated the model to incorporate the Project's planned water distribution system, which includes approximately 1.0 mile of 10-inch polyvinyl chloride (PVC) mains and 5.3 miles of 8-inch PVC mains, as shown on Figure 2. The Project's distribution system is planned to tie into the City's existing 10-inch distribution main on Barbara Terry Boulevard and 20-inch transmission main on River Islands Parkway. Parcels southern of River Islands Parkway are planned to connect to the existing 8-inch distribution main on Trestle Point.

Mossdale Landing West Water Demand Allocations

The water demands associated with the Project were added to the hydraulic model based on the proposed land use maps. The following standard peaking factors established in the 2024 IWRMP Amendment were used to estimate maximum day demands (MDD) and peak hour demands (PHD) for evaluating distribution system performance under peak demand conditions:

- MDD Peaking Factor = 1.7 x Average Day Demand (ADD)
- PHD Peaking Factor = 2.6 x ADD

The proposed Project MDD and PHD are shown in Table 3 below.

Table 3. Estimated Potable Water Maximum Day Demand and Peak Hour Demand

Demand Type	Peak Flow Factor	Estimated Demand
ADD	--	190 gpm
MDD	1.7	323 gpm
PHD	2.6	494 gpm

Abbreviations
gpm = gallons per minute

[4] Information provided by the City on 8 September 2023 through email exchange.
[5] Development projections provided by the City on 20 April 2023 through email exchange.

Modeling Scenarios

The following hydraulic modeling steady-state analyses were performed both with and without the Project under City buildout conditions to identify Project-specific capacity needs:

- Normal operations under PHD conditions to evaluate system pressure and pipe velocity and headloss; and
- MDD plus fire flow conditions to evaluate available fire flows.

Results of the modeling analyses were compared against the City's performance criteria.

Hydraulic Modeling Evaluation

PHD Conditions

The City's water system performance criteria require the following to be met under PHD conditions:

- Minimum Pressure – 40 pounds per square inch (psi) at customer service connections at all times excluding fire flow conditions.
- Maximum Pressure – 80 psi at customer service connections.
- Maximum Pipe Velocity – 6 feet per second (ft/s) for all system mains.
- Maximum Head Loss – 3 ft per 1,000 ft for mains equal to or larger than 16 inches in diameter, and 7 ft per 1,000 ft for mains less than 16 inches in diameter during peak hour demands.

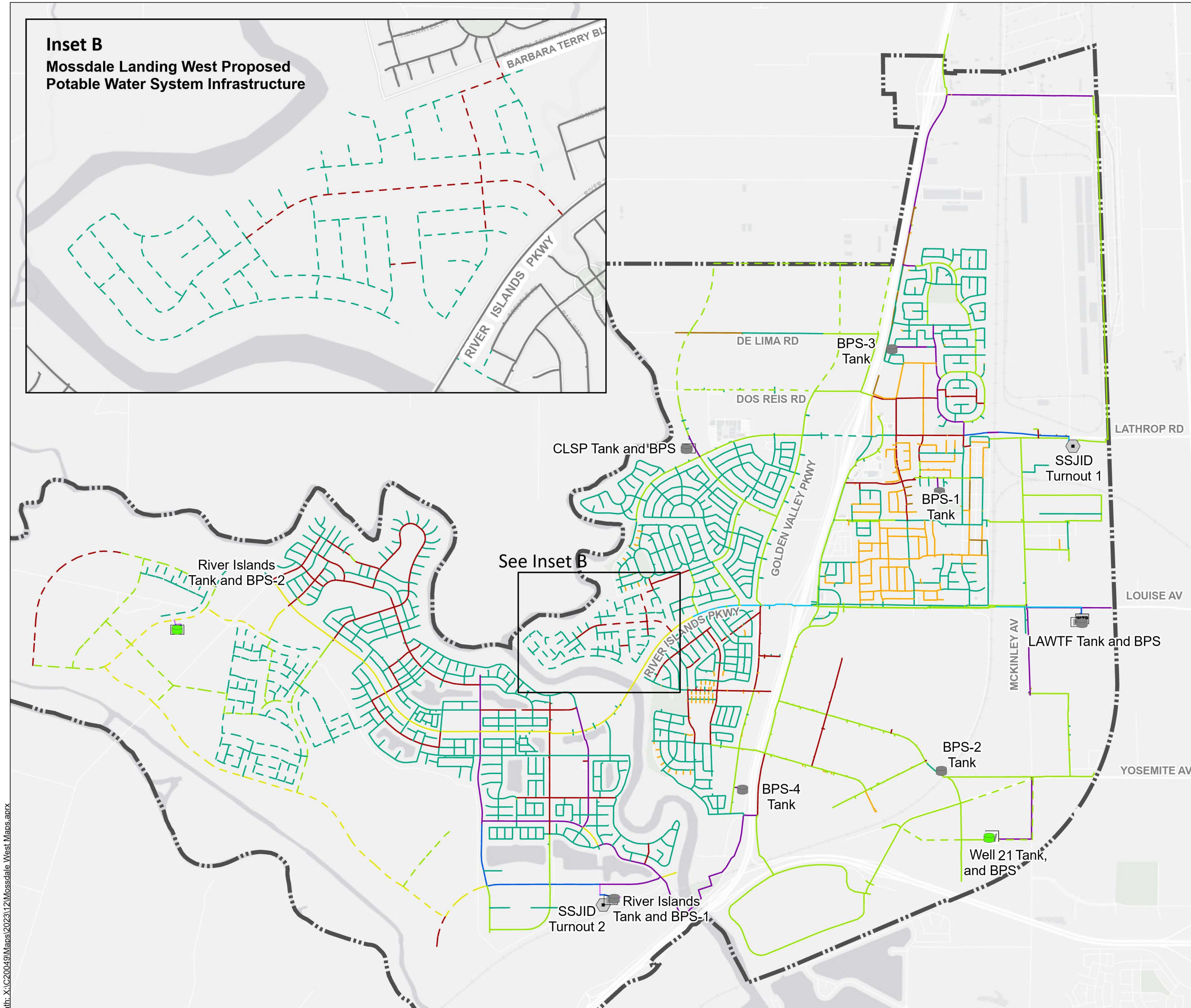
The modeled junction pressures under PHD conditions throughout Project site are shown on Figure 3. Note that only junctions with potable water demand have been included on the junction pressure map.

Based on the modeled results, the Project's proposed distribution system improvements can supply the Project's projected PHD while satisfying all relevant performance criteria.

A marginal decrease of 1 to 5 psi in the Central Lathrop and Mossdale Landing areas are observed with the addition of the Project. However, the Project is not anticipated to result in any pressure, velocity, or headloss deficiencies.

MDD Conditions plus Fire Flow

The modeled available fire flows (i.e., flows available at each hydrant while maintaining 20 psi across the system) at the Project site are geographically shown on Figure 4. The results indicated the City's water system can satisfy residential fire flow requirements of 1,250 gpm throughout the Project, and the Project will not induce new fire flow deficiencies in the rest of the City's system.



Modeled City-wide Buildout Infrastructure

Hydraulic Evaluation for Mossdale Landing West Development
City of Lathrop
Lathrop, CA
February 2024
C20049.06

eki environment & water

Figure 2

Legend

Sphere of Influence

Pipe

Junction Pressure, psi

- Less than 40 (Not Meeting Criteria)
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 65

Abbreviations

BPS = booster pump station
LAWTF = Louise Avenue Water Treatment Facility
PHD = Peak Hour Demand
SOI = Sphere of Influence
SSJID = South San Joaquin Irrigation District

Notes

1. All locations are approximate.

Sources

1. Aerial photograph provided by ESRI's ArcGIS Online, 16 January 2024.

N

0 200 400
(Scale in Feet)

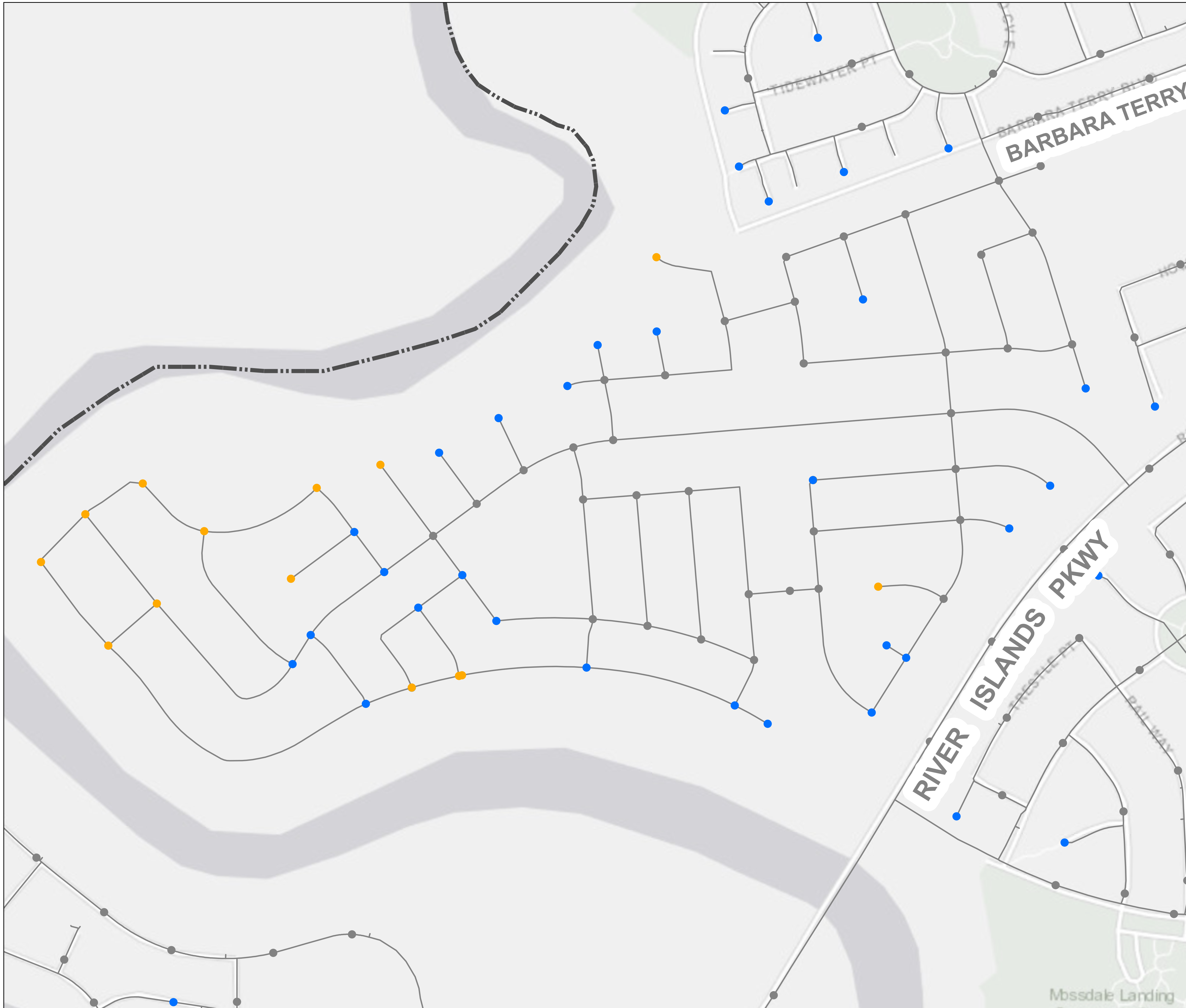
Development-wide Pressure under PHD

Hydraulic Evaluation for Mossdale Landing West Development
City of Lathrop
Lathrop, CA
February 2024
C20049.06

eki environment & water

Figure 3

Path: X:\C20049\Maps\2023\12\Mossdale West Maps.aprx



Legend

Sphere of Influence

Existing Infrastructure

- Treatment Plant
- Pump Station
- Enclosed Storage Facility
- SSJID Turnout
- Pipe

Available Fire Flow, Gallons per Minute

- Less than 1250
- 1250 - 2000
- 2000 - 3000
- 3000 - 4000
- Greater than 4000

Hydrant Residual Pressure Not Meeting Criteria

- Residual Pressure Below Requirement

Abbreviations

BPS = booster pump station
LAWTF = Louise Avenue Water Treatment Facility
MDD = Maximum Day Demand
SOI = Sphere of Influence
SSJID = South San Joaquin Irrigation District

Notes

1. All locations are approximate.

Sources

1. Aerial photograph provided by ESRI's ArcGIS Online, 16 January 2024.

N

0 400

(Scale in Feet)

Development-wide Hydrant Design Fire Flow under MDD

Hydraulic Evaluation for Mossdale Landing West Development
City of Lathrop
Lathrop, CA
February 2024
C20049.06

eki environment & water

Figure 4

Path: X:\C20049\Maps\2023\12\Mossdale West Maps.aprx

Hydraulic Modeling under Existing Scenario

EKI also performed modeling with the Project under the existing scenario to verify that the planned infrastructure that has not yet been built is not required to meet the performance criteria, given that the timing for construction of future infrastructure is uncertain. The modeling results confirmed that Project can be served by the existing system without any additional offsite improvements and meet system performance criteria.

Supply, Storage, and Pumping Evaluation

The City's required supply, storage, and pumping capacity requirements with the addition of the Project under 2035 demand conditions are conservatively compared to planned infrastructure capacities, considering that the Project will be completed by 2032.

Potable Water Supply Capacity Evaluation

The City's firm supply capacity is required to meet MDD without the use of stored water and booster pumps. This supply capacity can be provided by the firm pumping capacity at the existing South San Joaquin Irrigation District (SSJID) Turnouts 1 and 2 and the Louise Avenue Water Treatment Plant (LAWTF). Table 4 conservatively compares the required supply pumping capacity with 2035 demands inclusive of the Project to the existing firm supply capacity, assuming that the Project is completed before the future expansion of SSJID Turnout 2. The City currently has a total supply capacity of approximately 14,710 gpm or 21.2 MGD, and a surplus capacity of approximately 4,019 gpm or 5.8 MGD to support 2035 water demands with addition of the proposed Project.

Table 4. Potable Water Supply Capacity Evaluation

Supply Component		Required or Available Firm Supply Capacity (a)	
		gpm	MGD
Available Supply Capacity (Existing Supply Infrastructure)	SSJID Turnout 1 Capacity	5,210	7.5
	LAWTF Capacity (b)	5,500	7.9
	SSJID Turnout 2 Firm Capacity (c)	4,000	5.8
	Total Supply Capacity	**14,710**	**21.2**
Required Supply Capacity (2035 Demand Conditions)	Maximum Day Demand – Project	323	0.5
	Maximum Day Demand – City w/o Project	10,368	14.9
	Total Supply Requirement	**10,691**	**15.4**
Projected Peak Supply Capacity Surplus (Deficit)		**4,019**	**5.8**

Notes:
(a) Firm supply capacity reflects the capacity of the supply source with the largest pump offline.
(b) The LAWTF is supplied by wells 6,7,8, and 10 in the existing system. Well 9 is anticipated to be back online by 2025.
(c) The SSJID Turnout 2 has an existing firm capacity of 4,000 gpm. A planned expansion as part of the SSJID Phase 2 project is anticipated to increase capacity to 8,000 gpm by 2040.

Potable Water Storage Evaluation

The City's treated water storage capacity criteria includes operational storage, emergency storage, and fire storage corresponding to the sum of 25% of MDD, 75% of MDD, and concurrent high density residential and industrial fire flows, respectively. The existing storage facilities of the City's potable water system include Tanks 1, 2, 3, 4, 5, 6, and the LAWTF Tank, contributing to the total storage capacity of 7.4 million gallons (MG). The analysis below assumes that the planned 1 MG tank at the former Well 21 Site and the planned 3.6 MG for Tanks 5B and 5C will be completed by 2032.

In addition, the City's groundwater basin can account for a portion of the City's emergency storage requirement, and the groundwater credit of 6.0 MG for emergency storage is defined as the quantity of groundwater which can reliably be produced in the event of an emergency over an 18-hour period.

The evaluation criteria and results are summarized in Table 5, which indicate the City is anticipated to maintain a storage surplus with the addition of the Project, assuming that the planned tanks are constructed by 2032.

Table 5. Potable Water Storage Capacity Evaluation

Storage Component		Required or Available Capacity (MG)
Available Storage Capacity (Existing and Planned Tanks to be completed by 2032)	Existing Tank Storage Capacity (a)	7.4
	Planned Tank Storage Capacity (b)	4.6
	Ground Water Credit (c)	6.0
	Total Storage	**18.0**
Required Storage Capacity (2035 Demand Conditions)	Operational and Emergency – Project (d)	0.5
	Operational and Emergency – City w/o Project (d)	14.9
	Fire (e)	0.7
	Total Required Storage	16.1
Surplus Storage Capacity (f)		**1.9**

Note

(a) Existing tank storage capacity includes total capacity of Tanks 1, 2, 3, 4, 5, 6 and the LAWTF Tank. The tank storage capacity does not include the tank at the SSJID turnouts, which are not City facilities.

(b) Planned storage assumed to be completed by 2032 includes 1 MG for the planned tank at the Well 21 site and 3.6 MG for Tanks 5B and 5C. An additional 3.6 MG is planned for River Islands Phase 2 tanks by 2040.

(c) Groundwater credit is calculated as the firm capacity of the wells with backup power (i.e., with highest-capacity well with backup power out of service) over an 18-hour period. This is equal to the 18-hour maximum capacity of Wells 6, 7, 8, and 9. Well 10 is not included because it is highest-capacity well with backup power.

(d) Required operational and emergency storage equals a total of one maximum day demand.

(e) Required fire storage for one high density residential (2,000 gpm) fire and one industrial or heavy commercial fire (4,000 gpm). This Citywide requirement is not affected by the addition of the Project.

(f) Total may not sum due to rounding.

Potable Water Pumping Capacity Evaluation

The City's design criteria require firm pumping capacity among all water supply sources must be able to provide MDD plus two simultaneous fires (one industrial and one residential) or PHD, whichever is greater. The City-wide firm pumping capacity accounts for the total domestic and fire pumping capacity excluding the largest domestic pump at each BPS. For the purposes of this analysis, the City's existing pump stations plus the planned expansion of BPS-5 and the planned construction of the BPS at the former Well 21 Site are assumed to be online by 2032 when the Project is built out. The capacity of these existing and planned pump stations totals 45,210 gpm, as shown in Table 6.

The City's system is expected to maintain a pumping capacity surplus of approximately 28,519 gpm with the addition of the Project, assuming the planned pump stations are constructed by Project buildout.

Recommended Improvements to the Water System

The above assessment indicates that the addition of the Project will not induce new deficiencies in the City's water distribution system and that the City has sufficient supply, storage, and pumping capacities to support the Project as planned. It will be up to the City's discretion whether the Project should contribute to planned storage and pumping projects based on the project's contribution to the Citywide storage and pumping requirements.

Table 6. Potable Water Pumping Capacity Evaluation

Pumping Component (a)		Required or Available Firm Pumping Capacity (gpm)
Available Supply Capacity (Existing and Planned Tanks to be completed by 2032)	SSJID Turnout 1	5,210
	LAWTF Booster Station	6,300
	BPS-1	1,050
	BPS-2	3,000
	BPS-3	4,750
	BPS-4	4,600
	BPS-5 (b)	12,000
	BPS-6	5,300
	Planned BPS at the former Well 21 Site	3,000
	Total Available Firm Pumping Capacity	**45,210**
Criteria 1 – MDD Plus Two Concurrent Fires	Project Demand	323
	City 2035 Demand w/o Project	10,368
	Two Concurrent Fires (b)	6,000
	Total MDD + Fire Pumping Requirement	**16,691**
	MDD + 2 Fires Pumping Capacity Surplus	**28,519**
Criteria 2 – PHD	Project Demand	494
	City 2035 Demand w/o Project	15,857
	Total PHD Pumping Requirement	**16,351**
	PHD Pumping Capacity Surplus	**28,859**
Pumping Capacity Surplus (Deficit) (d)		**28,519**

Note

(a) Firm pumping capacity reflects the capacity of the pumping station with the largest domestic pump offline.
(b) Firm pumping capacity at buildout from City of Lathrop Phase I Potable Water Booster Pump station and storage Tank Expansion Plan at River Islands 100% Plans (PACE, 2022).
(c) Value is equal to the MDD plus the fire flow criteria for one high density residential fire (2,000 gpm) and one industrial fire (4,000 gpm).
(d) Total pumping capacity surplus or deficit reflects the most stringent criteria. Deficits will be made up by future booster pump stations.

WASTEWATER SYSTEM EVALUATION

As shown on Figure 5, the proposed Project is located in close proximity to the Mossdale Wastewater Pump Station (PS) and is anticipated to tie into the existing system immediately upstream of the Mossdale PS influent main. Currently, sewer profile designs have not yet been completed, therefore, the evaluation herein focuses on the City's treatment and pumping capacity available to convey Project flows.

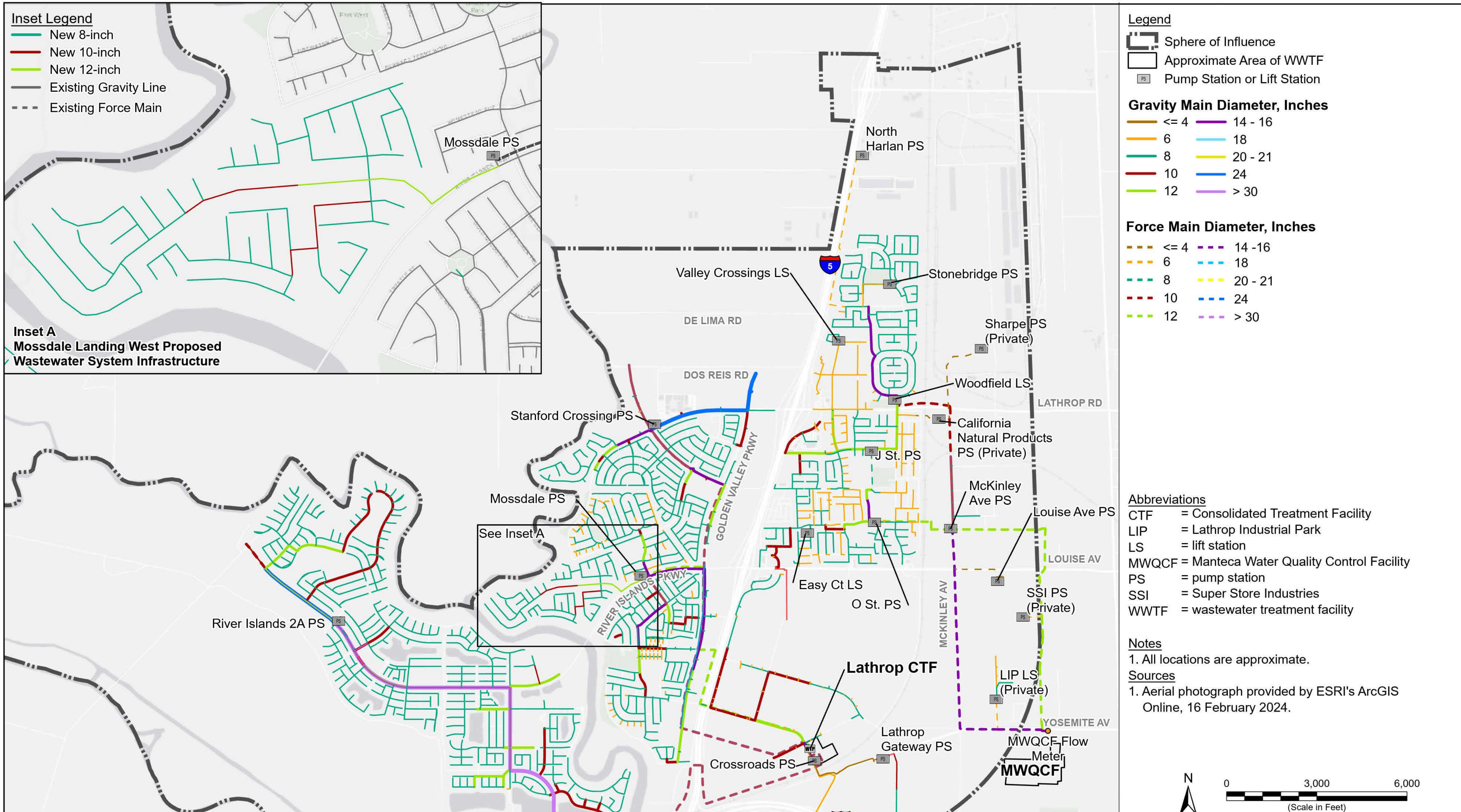
Treatment Capacity Evaluation

Wastewater from the Mossdale Landing West area will be conveyed through gravity mains in the Mossdale area and the Mossdale PS to be treated at the Lathrop Consolidated Treatment Facility (CTF). The City's projected average dry weather flows (ADWF) with and without the Project are compared with the existing and planned treatment capacities.

As shown in Table 7, the current Phase 2 expansion of the CTF has a treatment capacity of 2.5 MGD ADWF. The City anticipates completing the Lathrop CTF Phase 3 expansion before 2030 to expand CTF's capacity to a total of 5.0 MGD. The project is anticipated to generate an additional 0.2 MGD ADWF. The planned treatment capacity at CTF with the Phase 3 expansion is sufficient to meet ADWF through buildout (2045) inclusive of the Project. Because the Project has not purchased capacity from the CTF, it is recommended that the Project contribute to the Phase 3 expansion to support its buildout by 2032.

Table 7. Projected Wastewater Flow and Treatment Capacity at Lathrop CTF

	Estimated ADWF Influent and Treatment Capacity (MGD)				
	2025	**2030**	**2035**	**2040**	**2045**
Projected Influent ADWF					
City ADWF w/o Project	1.51	2.44	3.17	3.83	4.11
Proposed Project	--	--	0.20	0.20	0.20
City ADWF Inclusive of Project	1.51	2.44	3.37	4.03	4.31
Projected Capacity and Deficit					
Existing and Planned Capacity (a)	2.50	5.00	5.00	5.00	5.00
Projected Deficit Inclusive of Project	--	--	--	--	--



Modeled City-wide Wastewater System Infrastructure at Buildout

Hydraulic Evaluation for Mossdale Landing West Development
City of Lathrop
Lathrop, CA

eki environment & water

February 2024
C20049.02

Figure 5

Hydraulic Model Update and Assumptions

The wastewater collection system hydraulic evaluation is conducted using the City's wastewater hydraulic model, which has been updated as part of the draft 2024 amendment to the City's IWRMP and incorporates:

- Improvements to the wastewater collection system facilities, including gravity mains, force mains, and pump stations as of December 2023 (Figure 5);
- Projected wastewater generation at buildout estimated based on the City's development projections and 2023 land use-specific unit wastewater flow factors.

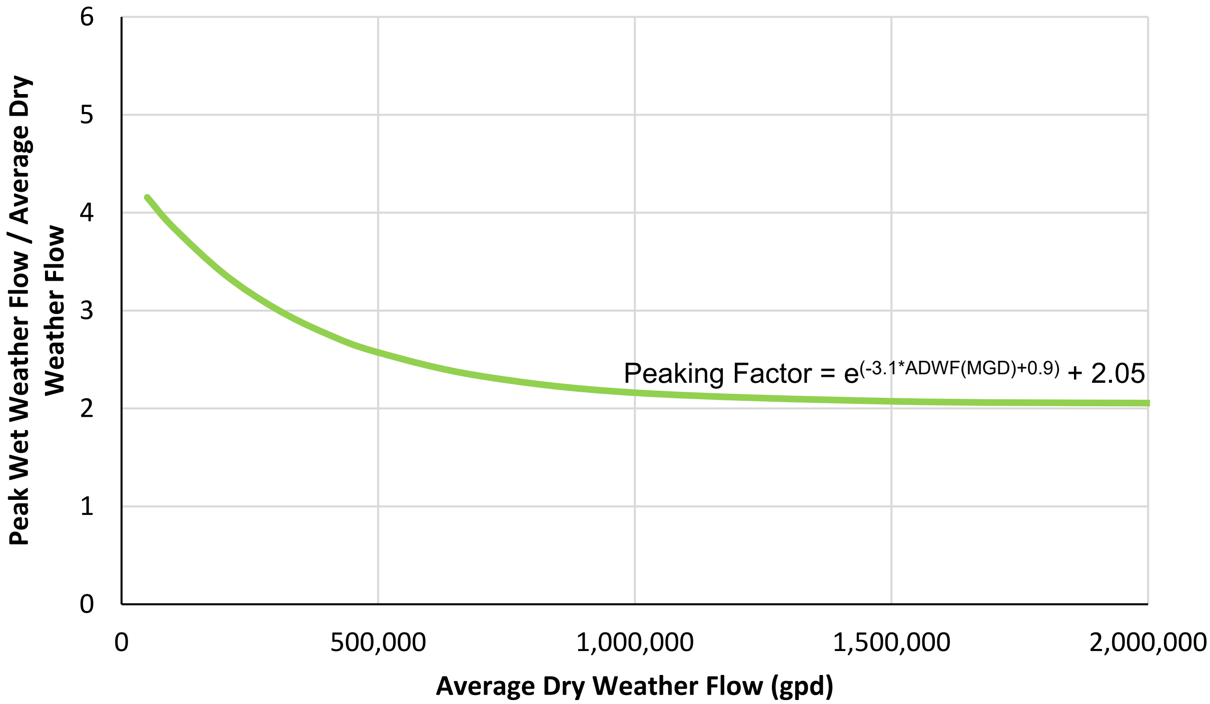
Mossdale Landing West Collection System

As described above, the Project's collection system ties in immediately upstream of the Mossdale PS. No sewer profile information is available within the Project area to evaluate planned Project improvements. Therefore, the Project's proposed collection was not added to the hydraulic model. The hydraulic model was updated to add the Project loading upstream of the Mossdale PS to evaluate the Mossdale PS's capacity to convey flows from the Project under buildout peak wet weather flow (PWWF) conditions.

Mossdale Landing West Wastewater Generation

Peaking factors from the draft 2024 IWRMP Amendment are applied to wastewater flow to estimate Project and City-wide PWWF (Figure 6). The project will result in an additional 0.34 MGD or 234 gpm PWWF at the Mossdale PS. The hydraulic modeling analyses were performed both with and without the Project to identify Project-specific capacity needs. Results of the modeling analyses were compared against the City's collection system performance criteria.

Figure 6. Draft 2024 IWRMP Amendment Wastewater Peaking Factor



Hydraulic Modeling Evaluation

Hydraulic modeling results were compared with and without the Project under the City's buildout conditions. The methods and criteria used to evaluate the collection system are based on the draft 2024 Wastewater Master Plan Amendment.

The primary criteria considered is whether the Mossdale PS has sufficient firm capacity[6] to convey PWWF (Table 8) with the Project at buildout conditions.

Table 9 summarizes the flow and total dynamic head (TDH) requirements under PWWF compared with firm capacity available at the Mossdale PS. As shown in

Table 9, the firm capacity of the Mossdale PS exceeds the projected flows with the Project.

[6] Defined as pumping capacity with the largest pumping unit out of service, i.e. capacity of the three out of four pumps at the Mossdale PS.

Table 8. Estimated ADWF and PWWF at the Mossdale PS

Flow Scenario	ADWF (mgd)	Peaking Factor	PWWF (mgd)	PWWF (gpm)
Buildout w/o Project	0.662	2.32	1.53	1,064
Buildout with Project	0.861	2.17	1.87	1,298

Table 9. Hydraulic Capacity Analysis for the Mossdale PS

Flow Scenario	PWWF (gpm)	Required TDH (ft)	Firm Capacity at the Required TDH (gpm)
Buildout w/o Project	1,064	46.8	4,050
Buildout with Project	1,298	58.9	3,450

EKI also evaluated whether the Mossdale PS force mains have sufficient capacity to convey Project flows at buildout. The maximum velocity in the force main cannot exceed 10 ft/s. Table 10 summarizes the modeled velocity in the 8-inch and 12-inch force mains connecting the Mossdale PS and the Lathrop CTF. As shown in the table, the Mossdale force mains have sufficient capacity to support flows from the proposed Project.

Table 10. Force Main Analysis for the Mossdale PS

Force Main Diameter	Velocity (ft/s)
Buildout w/o Project	
8”	1.75
12”	2.25
Buildout with Project	
8”	2.13
12”	2.74

Recommended Improvements to the Wastewater System

The above assessment indicates that the Project should contribute 0.2 MGD ADWF treatment capacity at the CTF. The addition of the Project will not induce new deficiencies in the City’s wastewater collection system.

RECYCLED WATER SYSTEM EVALUATION

As part of the draft 2024 IWRMP Amendment, EKI proposed recommendations to transition recycled water system operations as the City begins discharging excess wastewater to the San Joaquin River. The recommended system improvements include decommissioning the City's existing recycled water storage ponds, pump stations, and land application areas and installing a new enclosed reservoir (tank) and BPS located adjacent to the existing storage pond 5 (S5), as shown on Figure 7.

EKI considered the Project's recycled water demand in designing the recommended system improvements. The recycled water system evaluation herein includes (1) the Project's impacts on the required recycled water storage and pumping capacity and (2) verification of the Project's infrastructure alignment and the planned City-wide improvements using the City's hydraulic model.

Project's Impacts on Recycled Water Storage and Pumping Capacity

As shown in Table 11, the Project's average day and maximum month recycled water demand were calculated based on the estimated acreage of the proposed onsite Lot A Park, Lot C Park, and Lot L Park (Attachment A) and the Recycled Water Balance Evaluation methodology in the draft 2024 IWRMP Amendment.

Peaking factors are then used to estimate recycled water MDD and PHD for evaluating distribution system performance under peak demand conditions. The following peaking factors are applied as part of the draft 2024 IWRMP Amendment:

- MDD Peaking Factor = 1.25 x Maximum Month Demand (MMD)
- PHD Peaking Factor = 4 x MDD

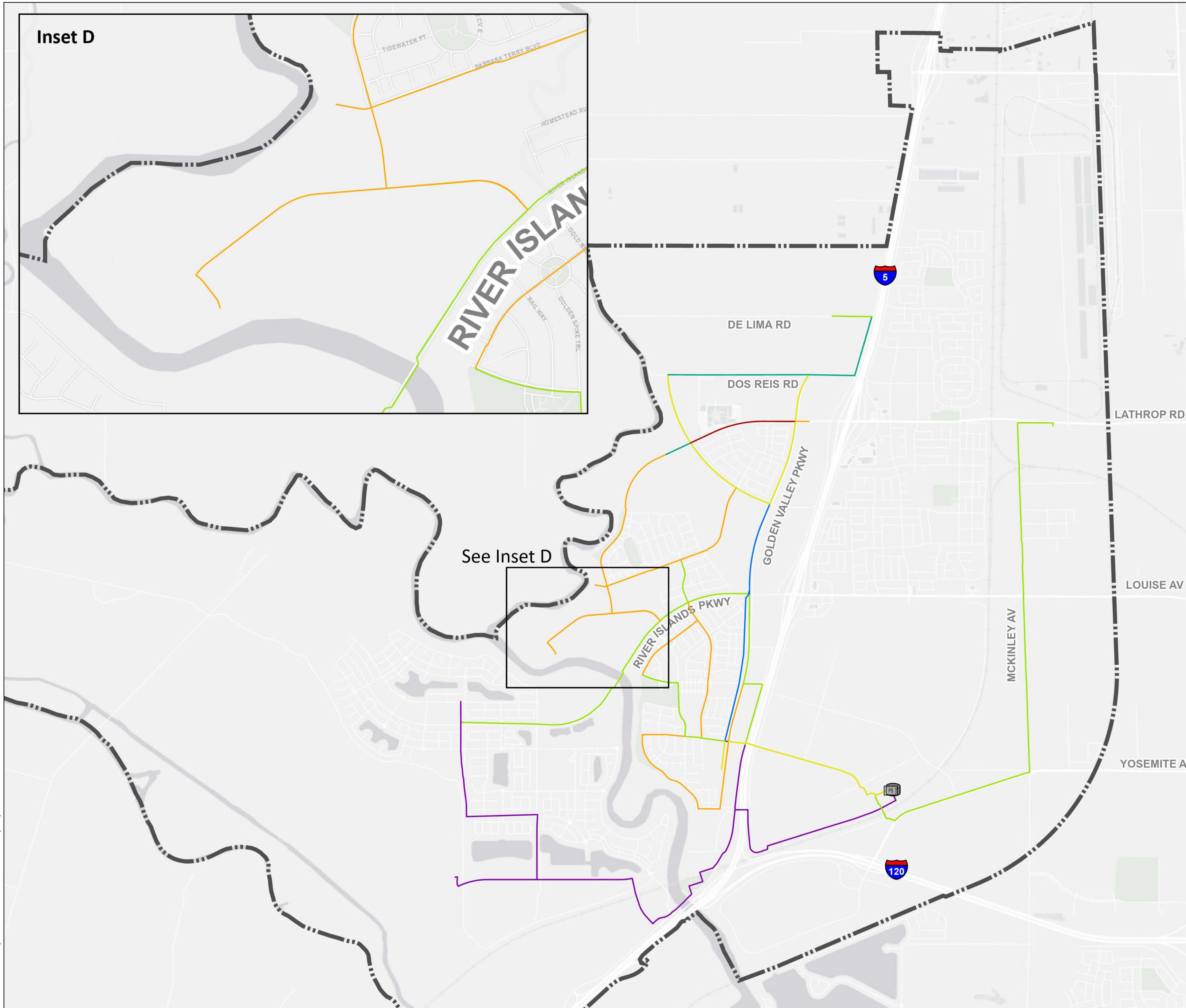
The proposed Project peak demands are calculated in Table 11 below:

Table 11. Estimated Project Recycled Water MDD and PHD

Demand Type	Peak Flow Factor	Estimated Demand
ADD (a)	--	27 gpm
MMD (a)	--	57 gpm
MDD	9,350 gpd/ac	71 gpm
PHD	37,400 gpd/ac	286 gpm

Note

(a) ADD and MMD are calculated using recycled water balance based on average year precipitation and evapotranspiration data.



Legend

- Sphere of Influence
- Pump Station
- Enclosed Storage Facility

Pipe Diameter, Inches

- 6
- 8
- 10
- 12
- 16
- 20
- 24

Abbreviations

BPS = booster pump station

SOI = Sphere of Influence

Notes

1. All locations are approximate.

Sources

1. Aerial photograph provided by ESRI's ArcGIS Online, 6 February 2024.

Recycled Water System Infrastructure

Hydraulic Evaluation for Mossdale Landing West Development
City of Lathrop
Lathrop, CA
February 2024
C20049.06

eki environment & water

Figure 7

Path: X:\C20049\Maps\2023\12\Mossdale West Maps.aprx

A new storage tank and BPS were sized based on the City's storage and pumping design criteria to support the City's buildout inclusive of the Project. As discussed below, the Project contributes to approximately 6.3% of the City-wide storage and pumping capacity requirement.

As recommended in the draft 2024 IWRMP Amendment, the City's recycled water storage capacity requirement is equivalent to one day of MDD. As shown in Table 12, the City's storage facility should have a storage capacity of 1.6 MG, of which 0.1 MG is associated with the demands of the proposed Project.

Table 12. Recycled Water Storage Capacity Evaluation

Required Storage Capacity	gpm	MGD
Maximum Day Demand – Project	71	0.1
Maximum Day Demand – City Buildout w/o Project	1,064	1.5
Total Storage Requirement	**1,136**	**1.6**

As shown in Table 13, the firm pumping capacity at the City's recycled water pump station must be able to provide PHD, which is a total of approximately 4,540 gpm inclusive of the Project, of which 286 gpm is associated with the Project.

Table 13. Recycled Water Pumping Capacity Evaluation

Required Pumping Capacity	gpm
Peak Hour Demand – Project	286
Peak Hour Demand – City Buildout w/o Project	4,257
Total Pumping Requirement	**4,542**

Hydraulic Model Update and Assumptions

For purposes of the hydraulic evaluation, EKI used the City's recycled water hydraulic model, which has been updated as part of amendments to the City's IWRMP. The hydraulic model incorporates and verifies the recommended system improvements and operations, discussed above. A new BPS with four 1,600 gpm variable frequency drive (VFD) pumps and hydropneumatic tank along with a 1.6 MG storage tank are configured near pond S5.

The hydraulic model incorporated the Project's proposed 6-inch main along Street C between the Lot L Park and River Islands Parkway (Attachment A). The Project's estimated recycled water demands of the proposed Lot L Park (approximately 5.8 acres), Lot C park (approximately 2.2 acres), and Lot A linear park (approximately 3 acres) are allocated to the nodes on the proposed 6-inch recycled water main along Street C.[7]

Modeling analyses under PHD conditions were performed for both with and without the Project under City buildout conditions to identify Project-specific capacity needs. Modeled system pressures were compared against the City's minimum pressure criteria of 45 psi.

[7] Park acreages estimated by digitizing the Mossdale Landing West Vesting Tentative Map (O'dell, July 2023).

Hydraulic Modeling Evaluation

The City's recycled water system performance criteria requires a minimum pressure of 45 psi to be maintained at each service connection across the system under PHD conditions. The hydraulic modeling analysis verified that the City's planned system improvements discussed above are sufficient to support Project development.

Recommended Improvements to the Recycled Water System

EKI incorporated the Project in designing planned system improvements (i.e. a new BPS and storage tank) to optimize future recycled water system operations. It is anticipated that the Project will contribute approximately 6.3% to the City's total storage and pumping capacity requirements at buildout. Hydraulic modeling results verified that the Project's proposed infrastructure alignment is capable of supporting the Project. However, given that the Project is in early phases of infrastructure planning, EKI recommends the Project conduct further system evaluations if additional changes are proposed.

CONCLUSION AND RECOMMENDATIONS

The above assessment indicates that the addition of the Project will not induce new deficiencies in the City's water distribution system and that the City has sufficient supply, storage, and pumping capacities to support the Project as planned. However, It will be at the City's discretion whether the Project should contribute to planned storage and pumping projects based on the project's contribution to the Citywide capacity requirements. It is recommended that the Project contribute to the Phase 3 expansion of the Lathrop CTF to support treatment of its 0.2 MGD wastewater generation anticipated by Project buildout. The addition of the Project will not induce new deficiencies in the City's wastewater collection system.

The Project's projected recycled water demand should be taken into consideration as the City plan for a new BPS and tank to optimize its recycled water system operations. It is recommended that the Project conducts further recycled water system evaluations if additional changes are proposed.

Attachments

Attachment A – Mossdale Landing West Vesting Tentative Map (O'Dell, 14 February 2024)

APPENDIX A

Mossdale Landing West Vesting Tentative Map

VICINITY MAP

N.T.S.

MOSSDALE LANDING WEST

VESTING TENTATIVE MAP

TRACT NO. 4146

GENERAL NOTES:

1) OWNER/APPLICANT: WSBG INVESTMENTS, LP
SURJIT CHAHAL
2217 COFFEE ROAD,
MODESTO, CA 95355
CONTACT: SURJIT CHAHAL
(209) 485-4089

2) CIVIL ENGINEER: O'DELL ENGINEERING
1165 SCENIC DRIVE, SUITE A
MODESTO, CA 95350
CONTACT: MIKE PERSAK
(209) 571-1765

3) ASSESSOR'S PARCEL NUMBERS: 191-190-010, 191-190-072, 191-610-020, 191-610-022, 191-620-590, 191-340-030.

4) SUBJECT PROPERTY SHOWN TO BE IN ZONE "X" ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAP 06077C0615F (AREAS PROTECTED BY LEEVES FROM THE 1% ANNUAL CHANCE FLOOD).

5) TOTAL AREA: 205.9± ACRES
TOTAL NUMBER OF LOTS: 829 SINGLE FAMILY RESIDENTIAL
14 OPEN SPACE/PARKS LOTS

6) POTABLE WATER, RECYCLED WATER, SANITARY SEWER AND STORM DRAIN SYSTEMS TO BE INSTALLED IN CONFORMANCE WITH CITY OF LATHROP STANDARDS AND MASTER UTILITY PLANS OR AS OTHERWISE APPROVED BY PUBLIC WORKS DIRECTOR.

   * WATER SUPPLY CITY OF LATHROP (GROUNDWATER AND SURFACE WATER)

   * SEWER TREATMENT AND DISPOSAL CITY OF LATHROP.

   * LOT 538 IS RESERVED AS A POTENTIAL SANITARY SEWER PUMP STATION LOCATION.

   * STORMWATER CITY OF LATHROP – DISCHARGE TO SAN JOAQUIN RIVER. IF ULTIMATE OUTFALL IS NOT IN PLACE AT TIME OF CONSTRUCTION STORM DRAINAGE TO BE TEMPORARILY RETAINED.

7) GAS & ELECTRIC SERVICE TO BE PROVIDED BY PACIFIC GAS & ELECTRIC. INSTALLATION SHALL BE IN CONFORMANCE WITH CITY STANDARDS AND CENTRAL LATHROP SPECIFIC PLAN. EXISTING SERVICES SHALL BE PLACED UNDERGROUND IN CONFORMANCE WITH THE SUBDIVISION ORDINANCE.

8) TELEPHONE SERVICE TO BE PROVIDED BY AT&T. EXISTING SERVICES SHALL BE PLACED UNDERGROUND IN CONFORMANCE WITH THE SUBDIVISION ORDINANCE.

9) STREET CROSS SECTIONS AND MINIMUM CENTERLINE RADII ARE IN CONFORMANCE WITH WEST LATHROP SPECIFIC PLAN. ROAD IMPROVEMENTS TO BE INSTALLED PER CITY OF LATHROP STANDARDS AND WEST LATHROP SPECIFIC PLAN. WHEN STANDARDS DIFFER THE SPECIFIC PLAN SHALL PREVAIL. ROADS TO BE PUBLICLY OWNED AND MAINTAINED UNLESS NOTED OTHERWISE.

10) EXISTING ZONING: RL-MV, CV-MV, P-MV, REC-RES-MV.

11) EXISTING USE: VACANT

12) PROPOSED USE: P-MV, RL-MV

13) EXISTING GROUND ELEVATIONS SHOWN OR NOTED ARE BASED ON THE TOPOGRAPHY SURVEY PERFORMED ON FEBRUARY 16, 2022.

14) UNLESS OTHERWISE SPECIFICALLY STATED IN THE CONDITION OF APPROVAL, LOCAL AGENCY APPROVAL OF THIS MAP SHALL CONSTITUTE AN EXPRESSED FINDING THAT THE PROPOSED DIVISION AND DEVELOPMENT OF THE PROPERTY WILL NOT UNREASONABLY INTERFERE WITH THE FREE AND COMPLETE EXERCISE OF RIGHTS DESCRIBED IN GOVERNMENT CODE SECTION 66436(a)(3)(A)(i).

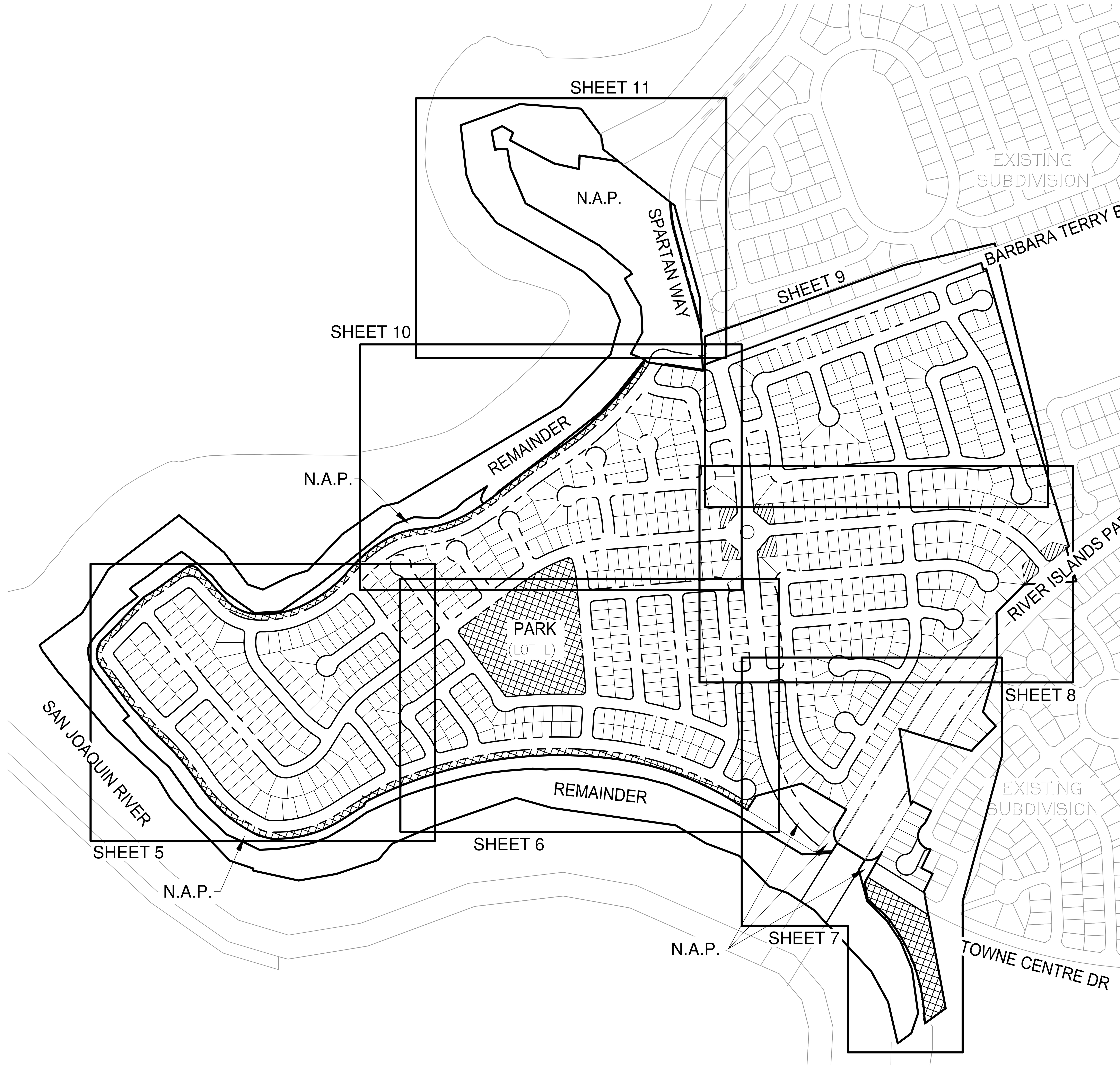
15) UTILITY LOCATIONS AND LOT DIMENSIONS ARE PRELIMINARY AND SUBJECT TO FINAL ENGINEERING DESIGN.

16) THE PROJECT MAY BE PHASED. MULTIPLE FINAL MAPS MAY BE FILED ON THE LANDS SHOWN ON THIS VESTING TENTATIVE MAP IN ACCORDANCE WITH ARTICLE 4, SECTION 66.456.1 OF THE SUBDIVISION MAP ACT.

17) SANITARY SEWER PIPES ARE 8" MINIMUM, POTABLE WATER PIPES ARE 8" MINIMUM, RECYCLED WATER PIPES ARE 6" MINIMUM, STORM DRAIN PIPES ARE 15"MIN.

18) THE APPLICANT RESERVES THE RIGHT TO PHASE PROJECT PER THE SUBDIVISION MAP ACT.

19) THE BOUNDARY AS SHOWN IS COMPILED FROM RECORD INFORMATION.



N

0 150 300 600

SCALE: 1" = 300'

SHEET INDEX

LEGEND

Symbol	Description
	PROJECT BOUNDARY
	RIGHT-OF-WAY
	PROPERTY LINE
	CENTERLINE
	10' P.U.E.
W	WATER LINE
RW	RECLAIMED WATER LINE
SS	SANITARY SEWER LINE
SD	STORM DRAIN LINE
W	EXISTING WATER LINE
IRR	EXISTING IRRIGATION LINE
RW	EXISTING RECLAIMED WATER LINE
SS	EXISTING SANITARY SEWER LINE
SD	EXISTING STORM DRAIN LINE
	EXISTING FIRE HYDRANT
	EXISTING WATER VALVE
	EXISTING SANITARY SEWER MANHOLE
	EXISTING STORM DRAIN MANHOLE
	EXISTING STORM DRAIN INLET
	EXISTING STORM DRAIN CATCH BASIN
N.A.P.	NOT A PART OF THIS SUBDIVISION
	LANDSCAPED ENTRY
	PARK

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

MOSSDALE LANDING WEST

VESTING TENTATIVE MAP

LATHROP, CALIFORNIA

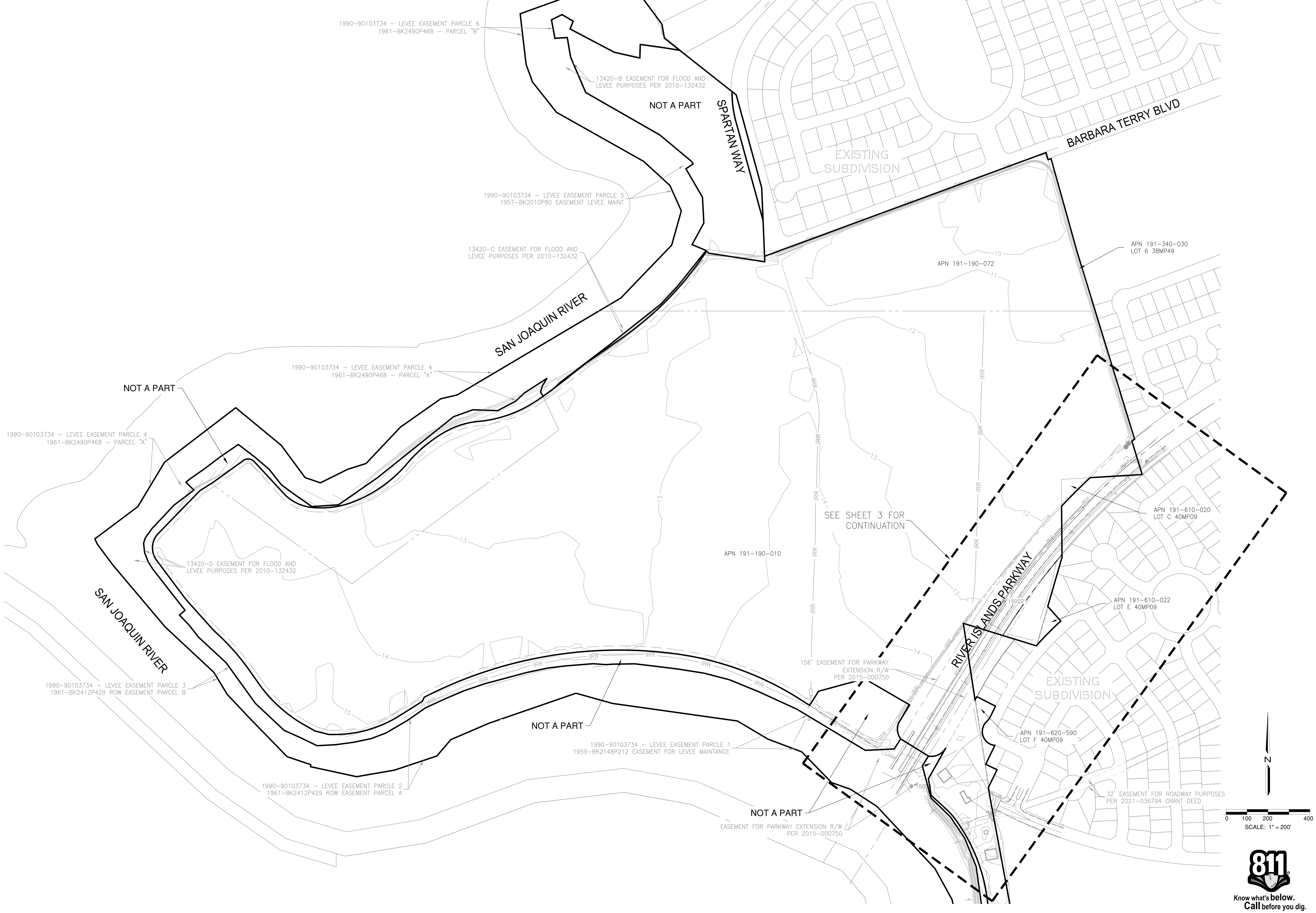
COVER SHEET

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

NOTES:

1. THE BOUNDARY SHOWN IS COMPILED FROM RECORD INFORMATION.



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

EXISTING CONDITIONS

APPROVED:

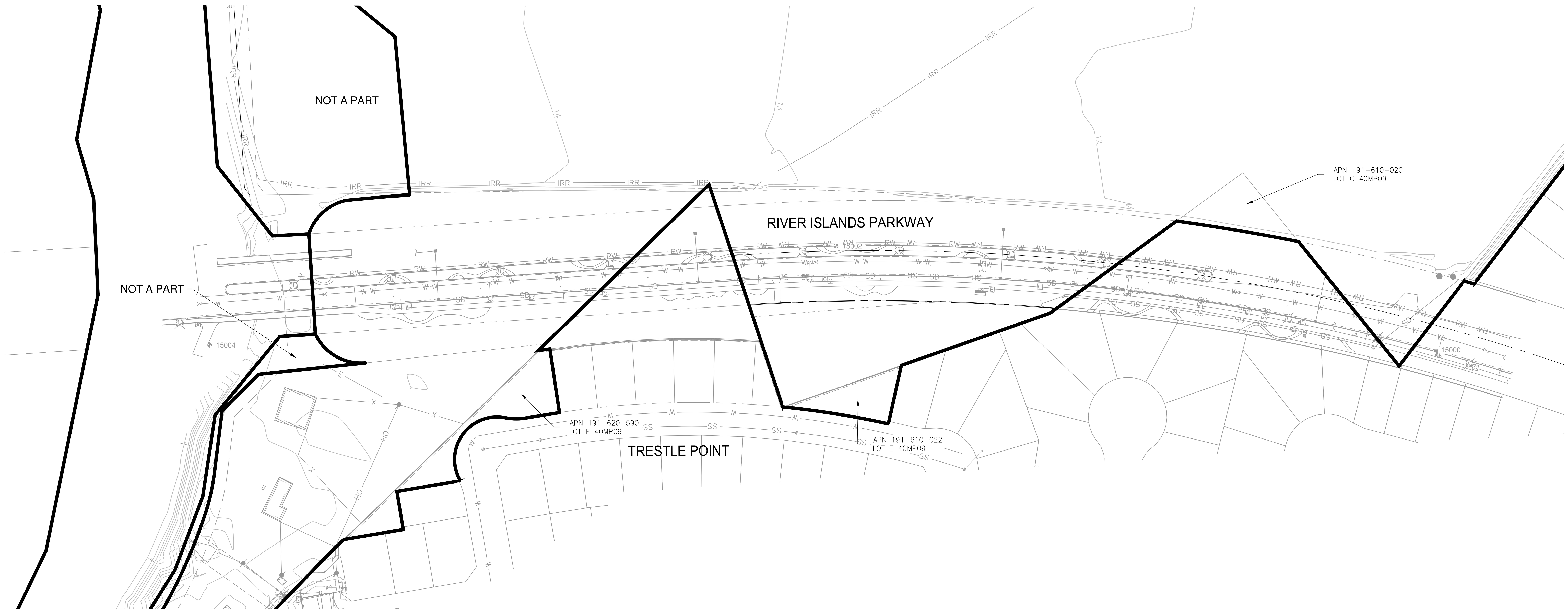
DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
2
OF
12

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg ehomed 14:13:14 02/14/2024

NOTES:

1. THE BOUNDARY SHOWN IS COMPILED FROM RECORD INFORMATION.



0 40 80 160
SCALE: 1" = 80'

PLAN REVISIONS		
NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

MOSSDALE LANDING WEST

VESTING TENTATIVE MAP

LATHROP, CALIFORNIA

EXISTING CONDITIONS

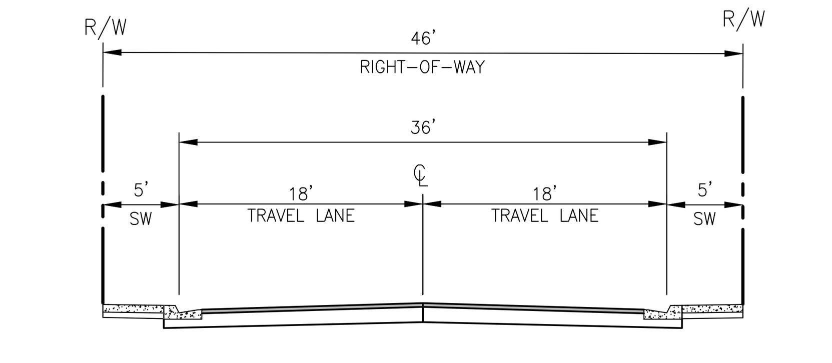
APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

811 Know what's below. Call before you dig.

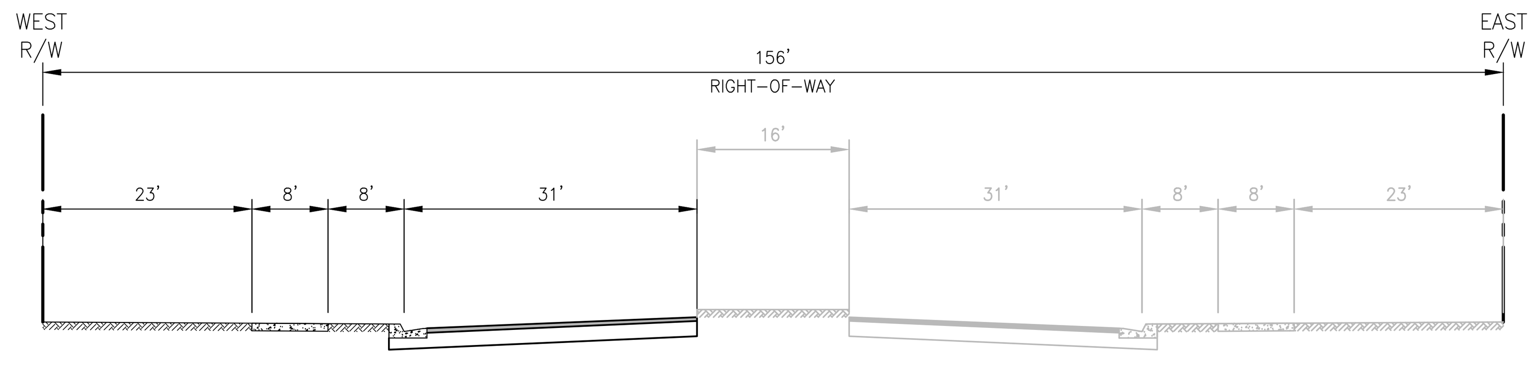
SHEET NO.
3
OF
12

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg ehamed 14:13:14 02/14/2024



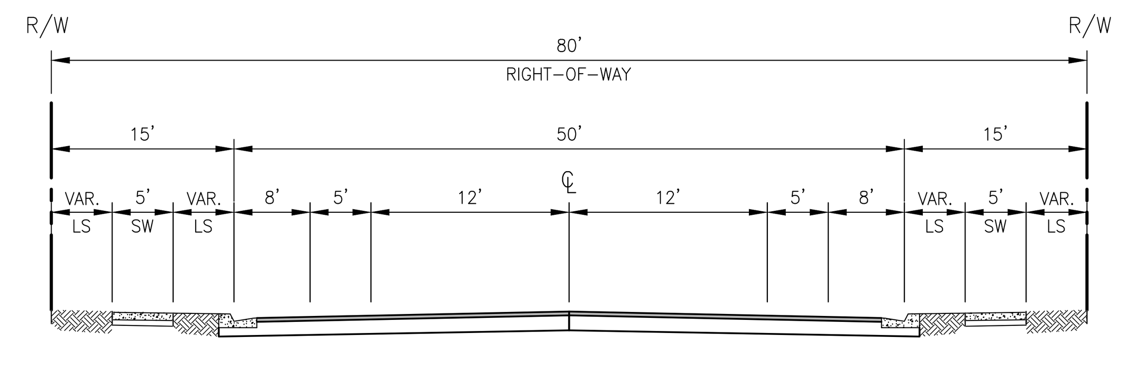
1 INTERIOR STREETS CROSS SECTION

NOT TO SCALE



2 RIVER ISLANDS PARKWAY CROSS SECTION

NOT TO SCALE

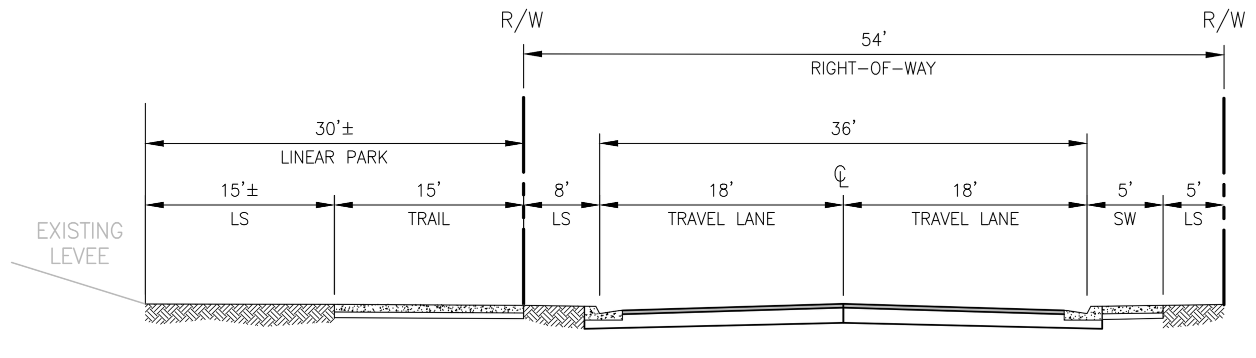


3 TOWNE CENTRE DRIVE CROSS SECTION

NOT TO SCALE

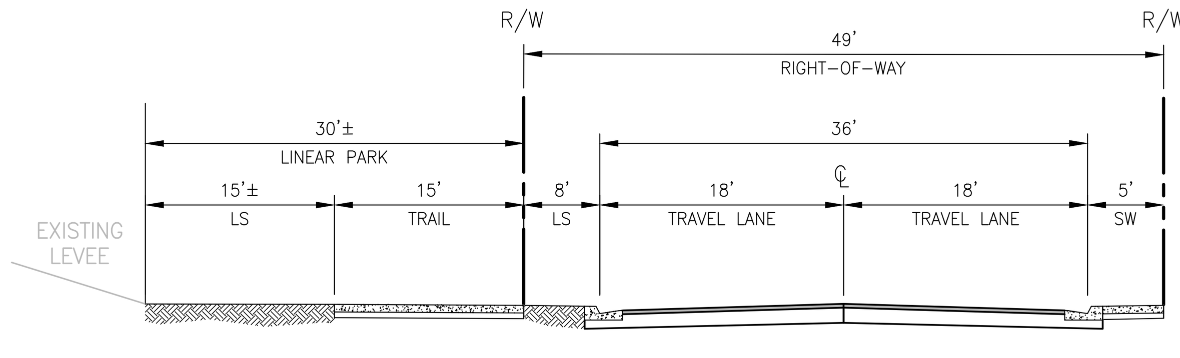
LEGEND

LANDSCAPED ENTRY



4 STREET A CROSS SECTION (54' ROW)

NOT TO SCALE

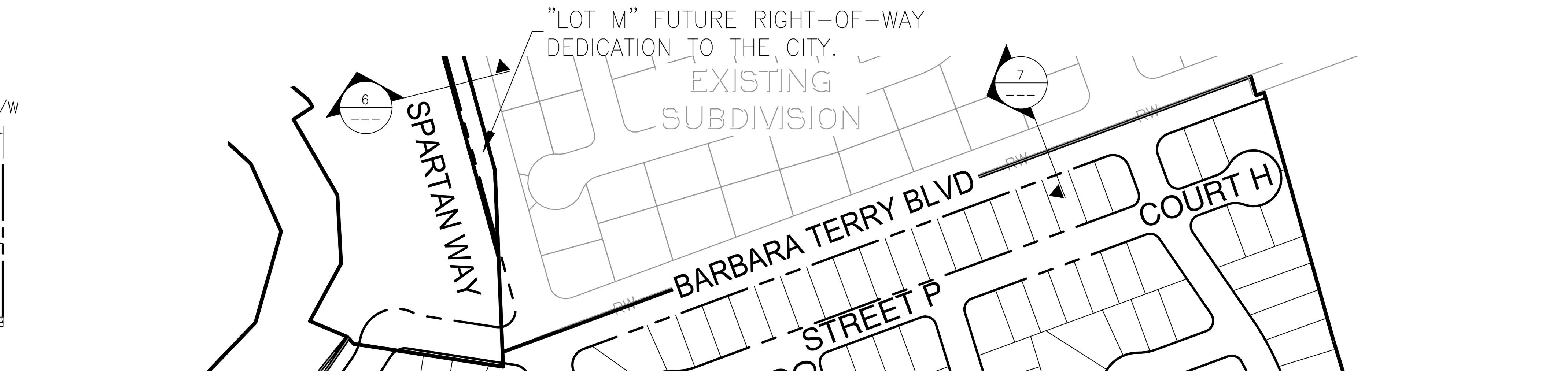
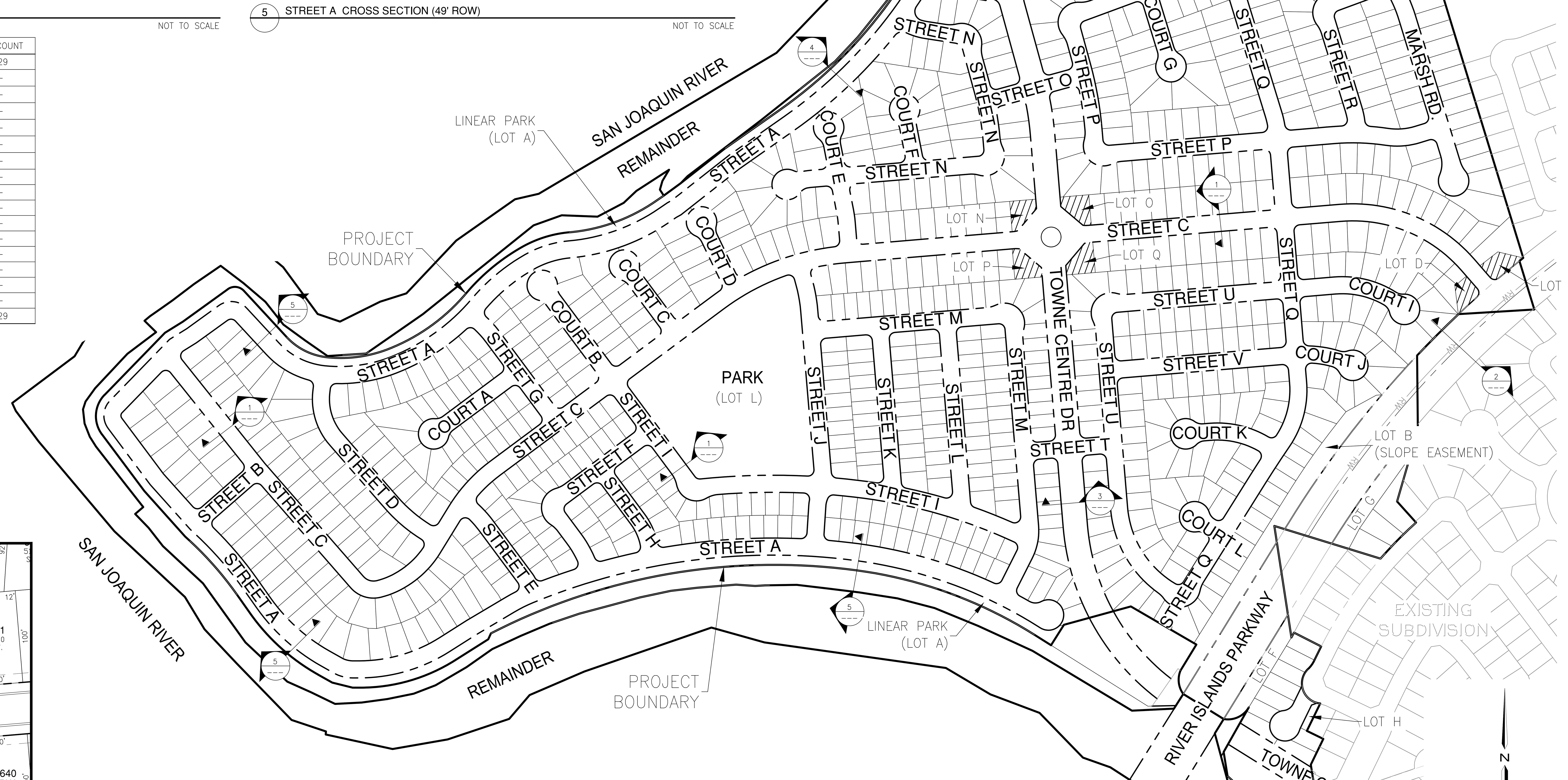
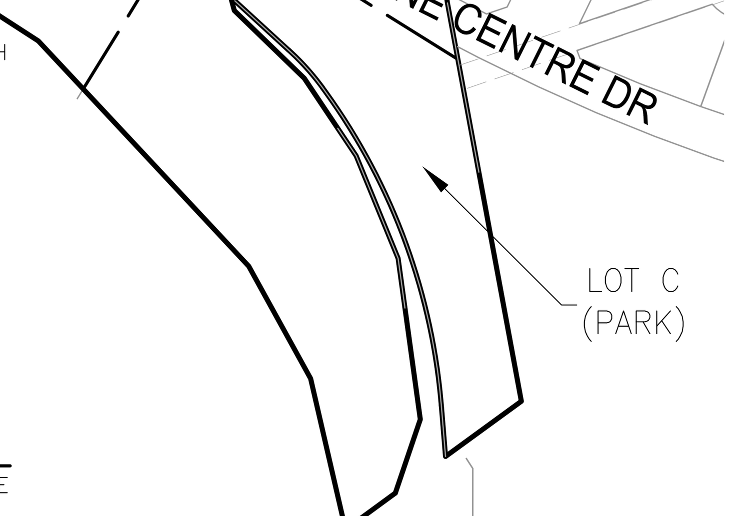


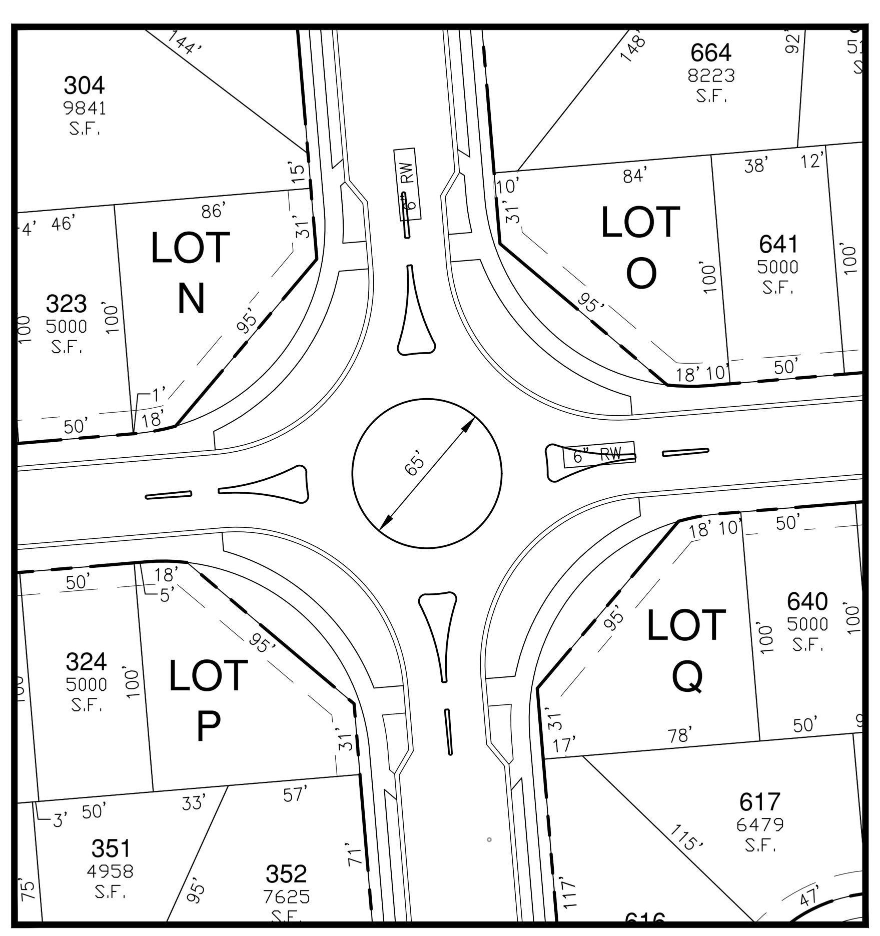
5 STREET A CROSS SECTION (49' ROW)

NOT TO SCALE

PARCEL/USE	ACREAGES	LOT COUNT
RESIDENTIAL	146.7±	829
RIVER ISLANDS PARKWAY	4.4±	–
LINEAR PARK (LOT A) *	4.8±	–
NEIGHBORHOOD PARK (LOT L) *	6.2±	–
SLOPE EASEMENT (LOT B) *	1.4±	–
LOT C (PARK) *	2.0±	–
LANDSCAPED ENTRIES (LOT D & E)	0.3±	–
LOT F *	0.4±	–
LOT G *	0.6±	–
LOT H *	0.1±	–
LOT M *	0.4±	–
LOT N *	0.1±	–
LOT O *	0.1±	–
LOT P *	0.1±	–
LOT Q *	0.1±	–
REMAINDER	38.2±	–
TOTAL	205.9±	829

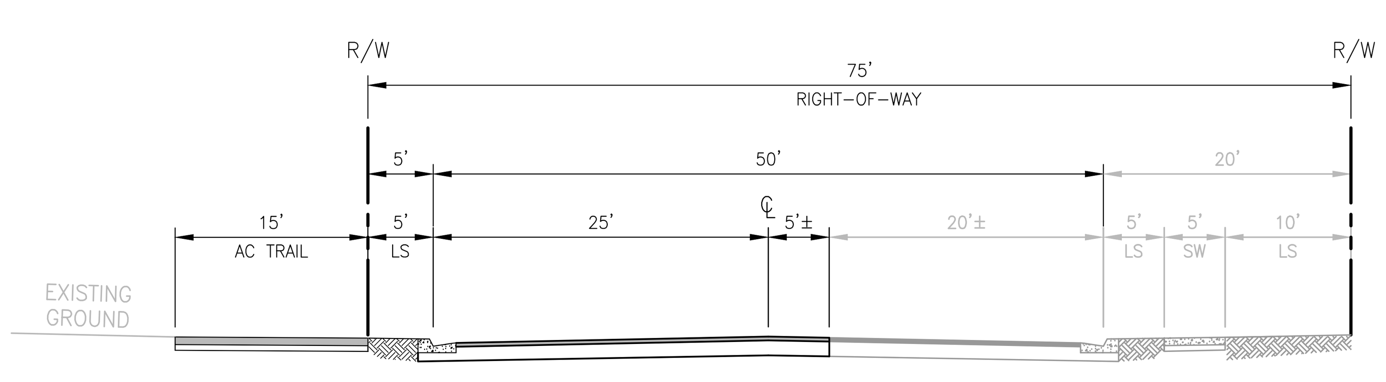
* LOT DEDICATED TO THE CITY



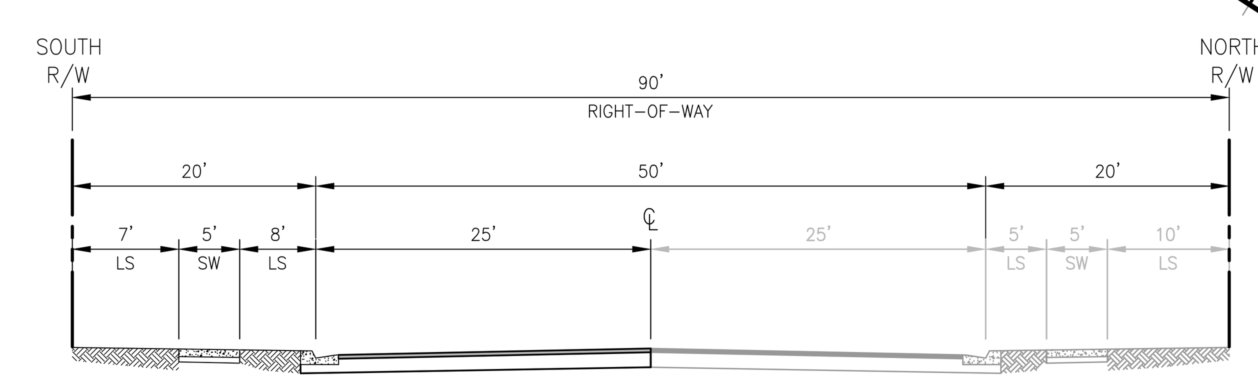
ROUNDABOUT DETAIL

NOT TO SCALE



6 SPARTAN WAY CROSS SECTION

NOT TO SCALE



7 BARBARA TERRY BOULEVARD CROSS SECTION

NOT TO SCALE

Know what's below. Call before you dig.

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

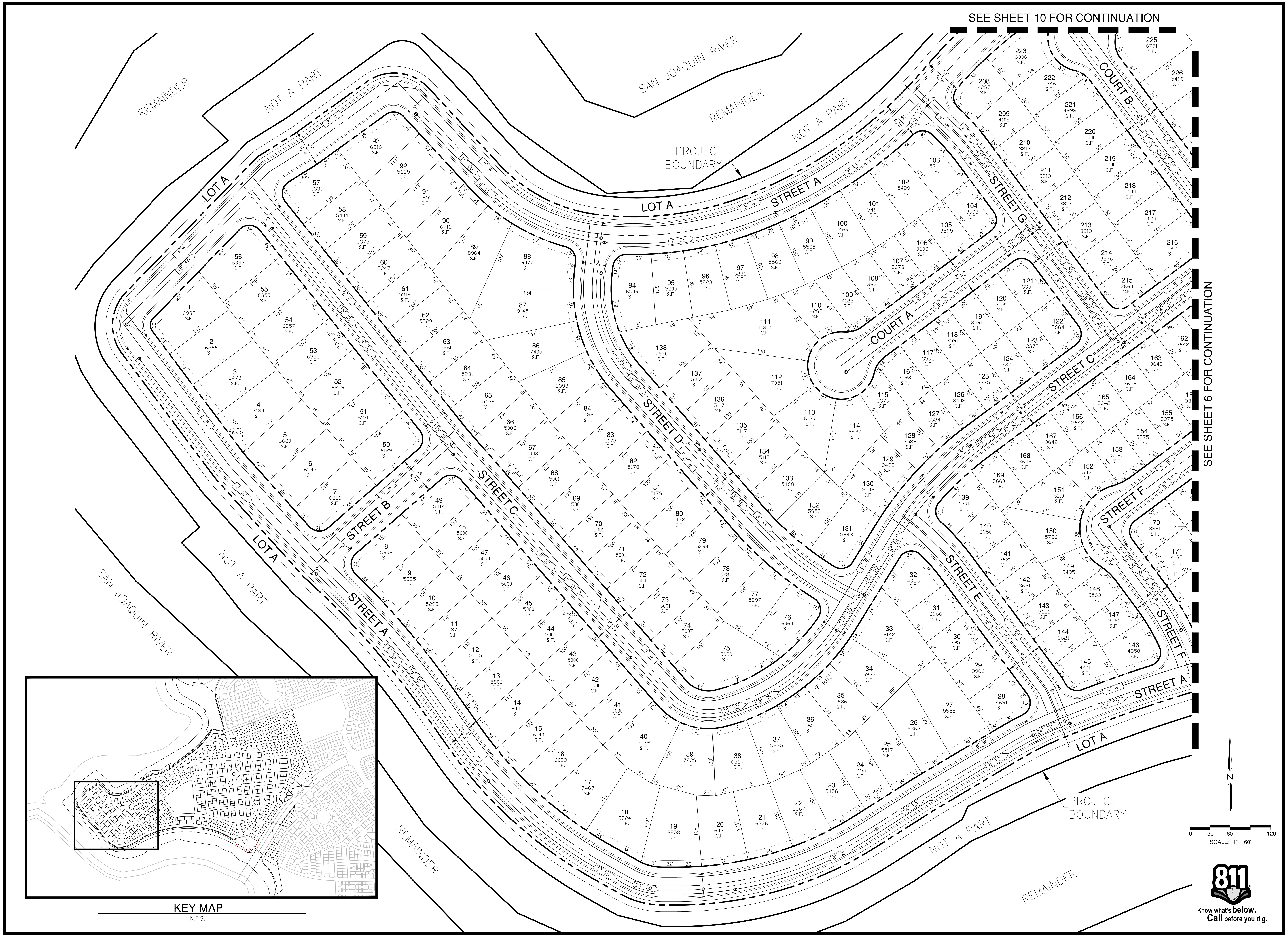
MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

STREET CROSS SECTIONS

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
4
OF
12



H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg ehomed 14:14:14 02/14/2024

PLAN REVISIONS

NO.	DATE	REVISION

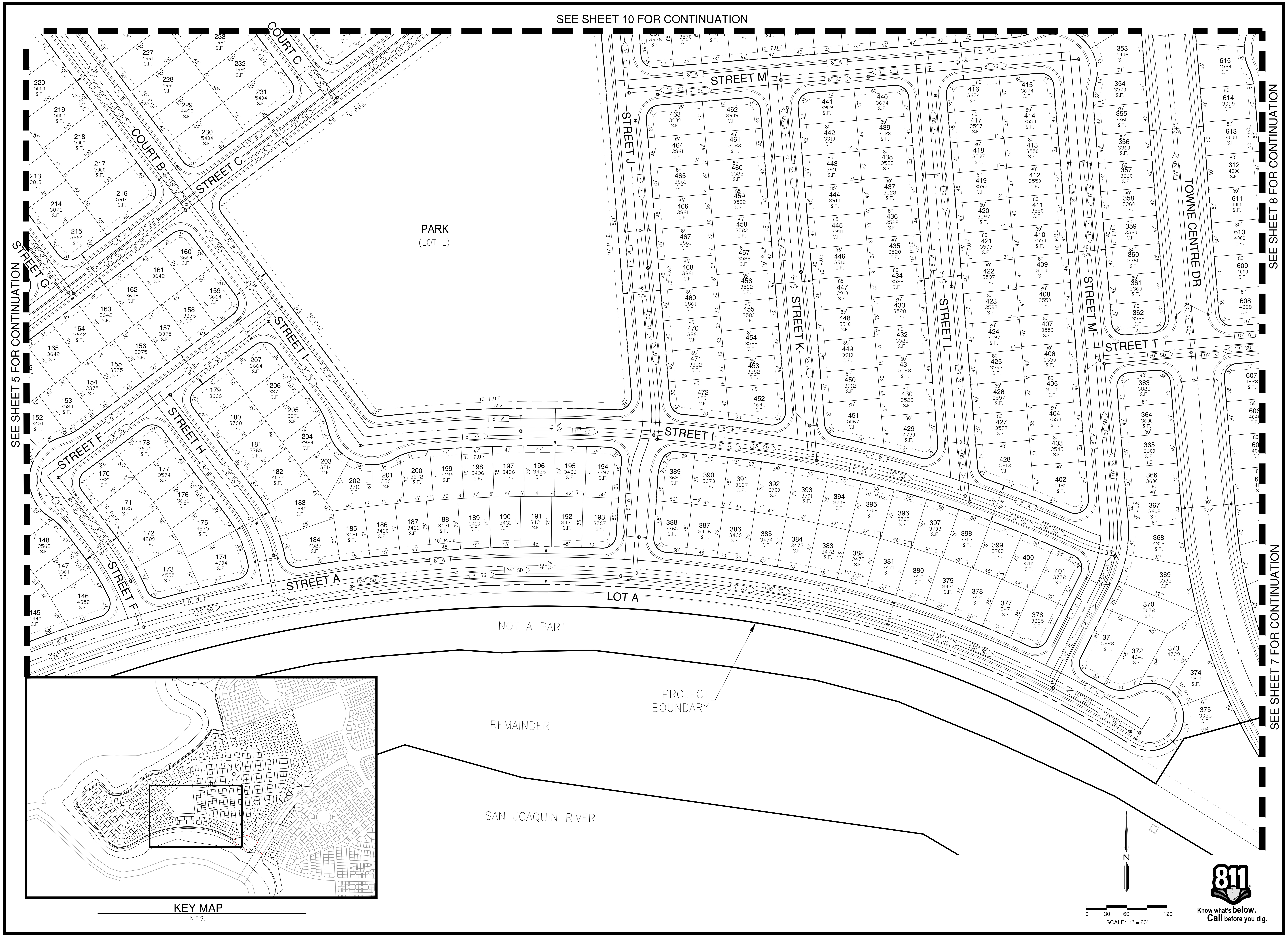
O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

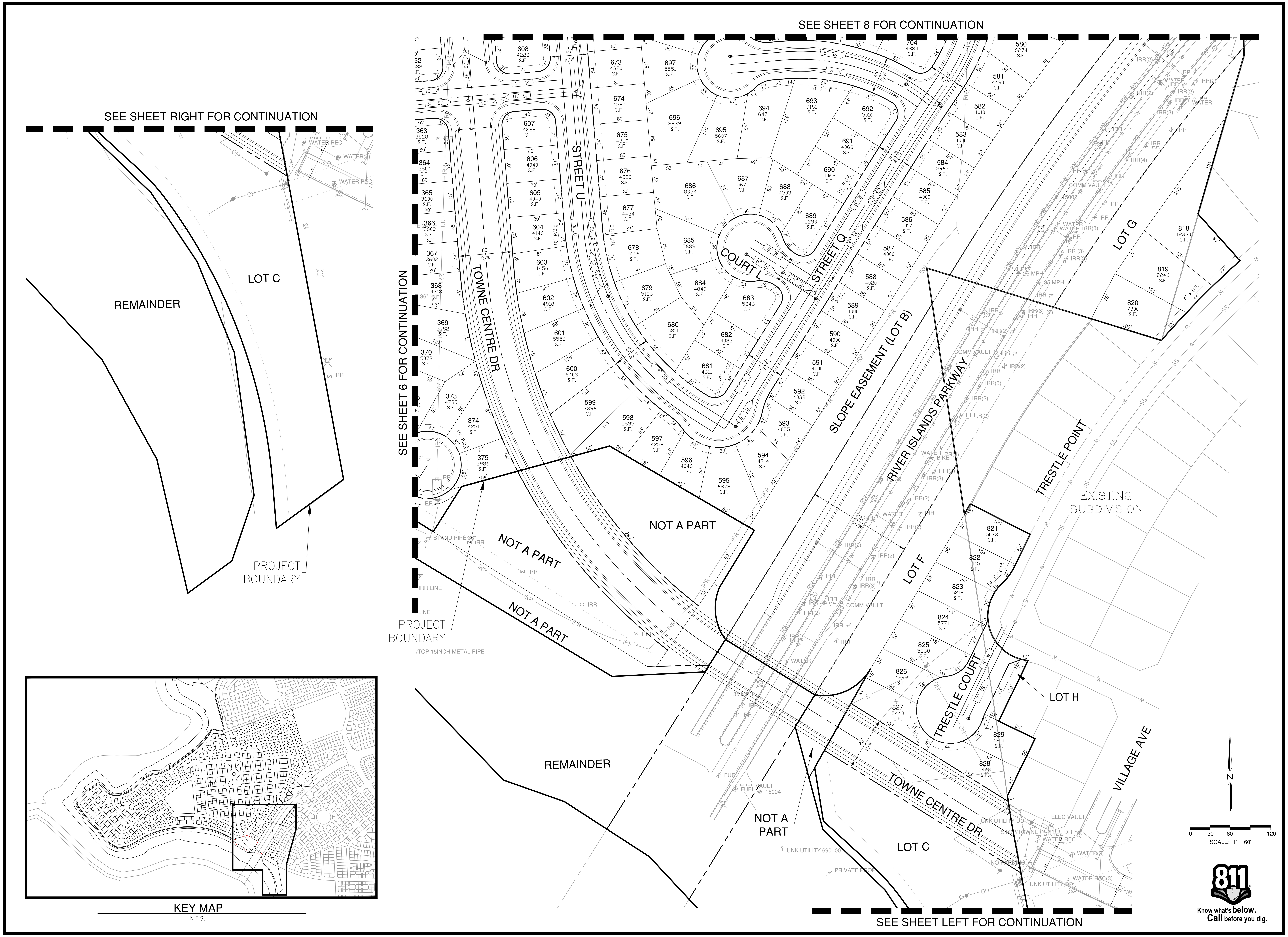
LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
6
OF
12

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg ehomed 14:14:14 02/14/2024



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

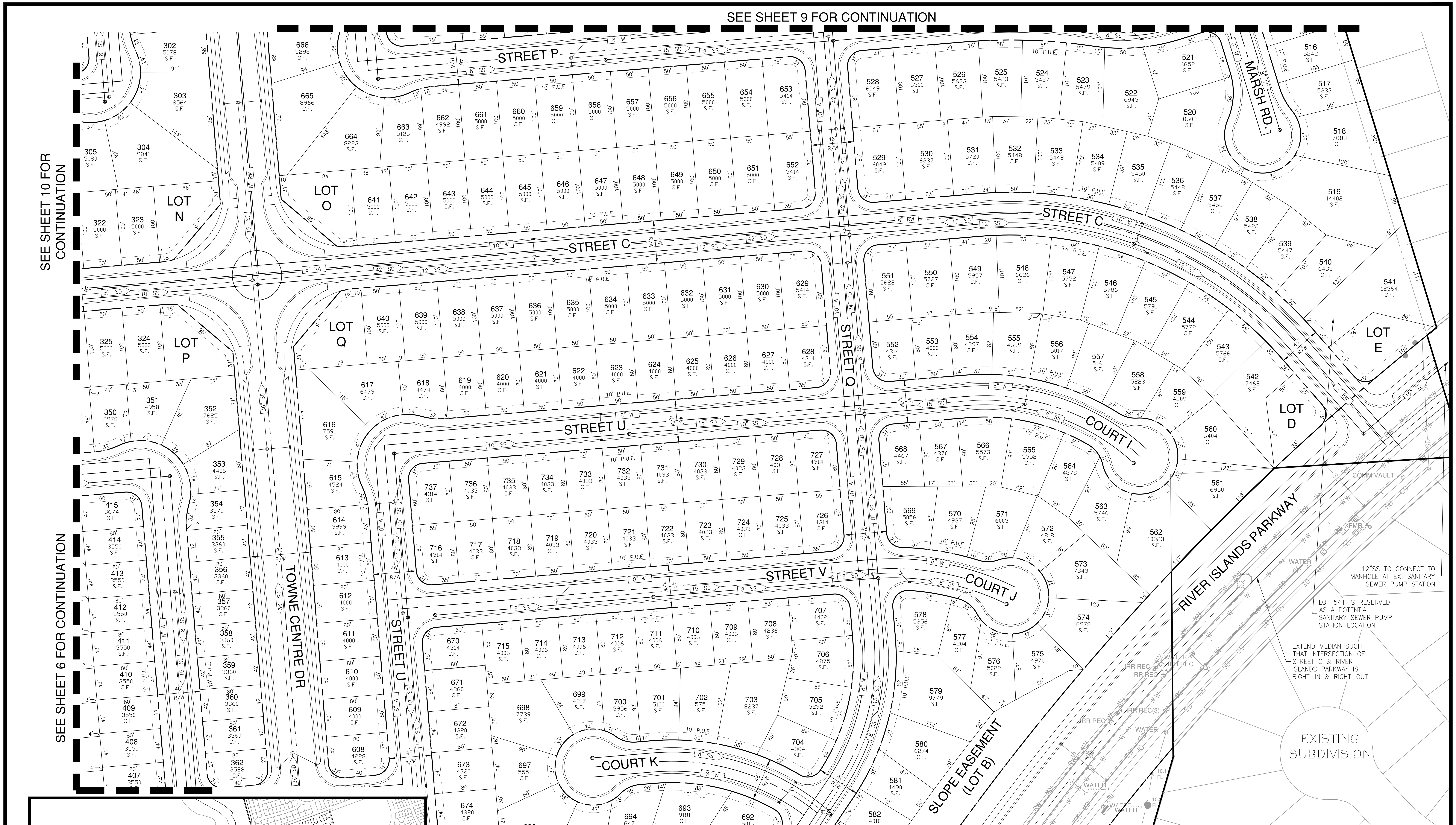
MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

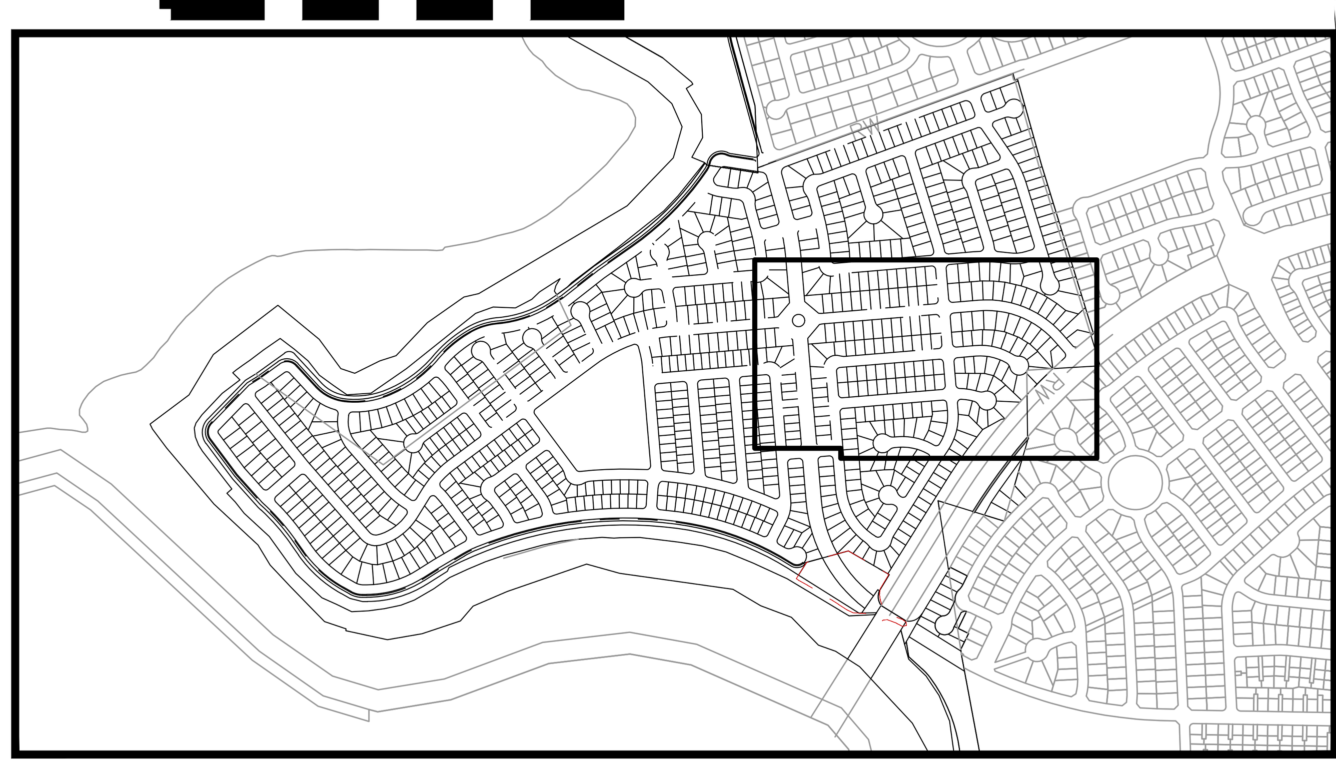
LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
7
OF
12





KEY MAP
N.T.S.

N

0 30 60 120
SCALE: 1" = 60'

811 Know what's below. Call before you dig.

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
8
OF
12

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg ehomed 14:15:14 02/14/2024

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

MOSSDALE LANDING WEST

VESTING TENTATIVE MAP

LATHROP, CALIFORNIA

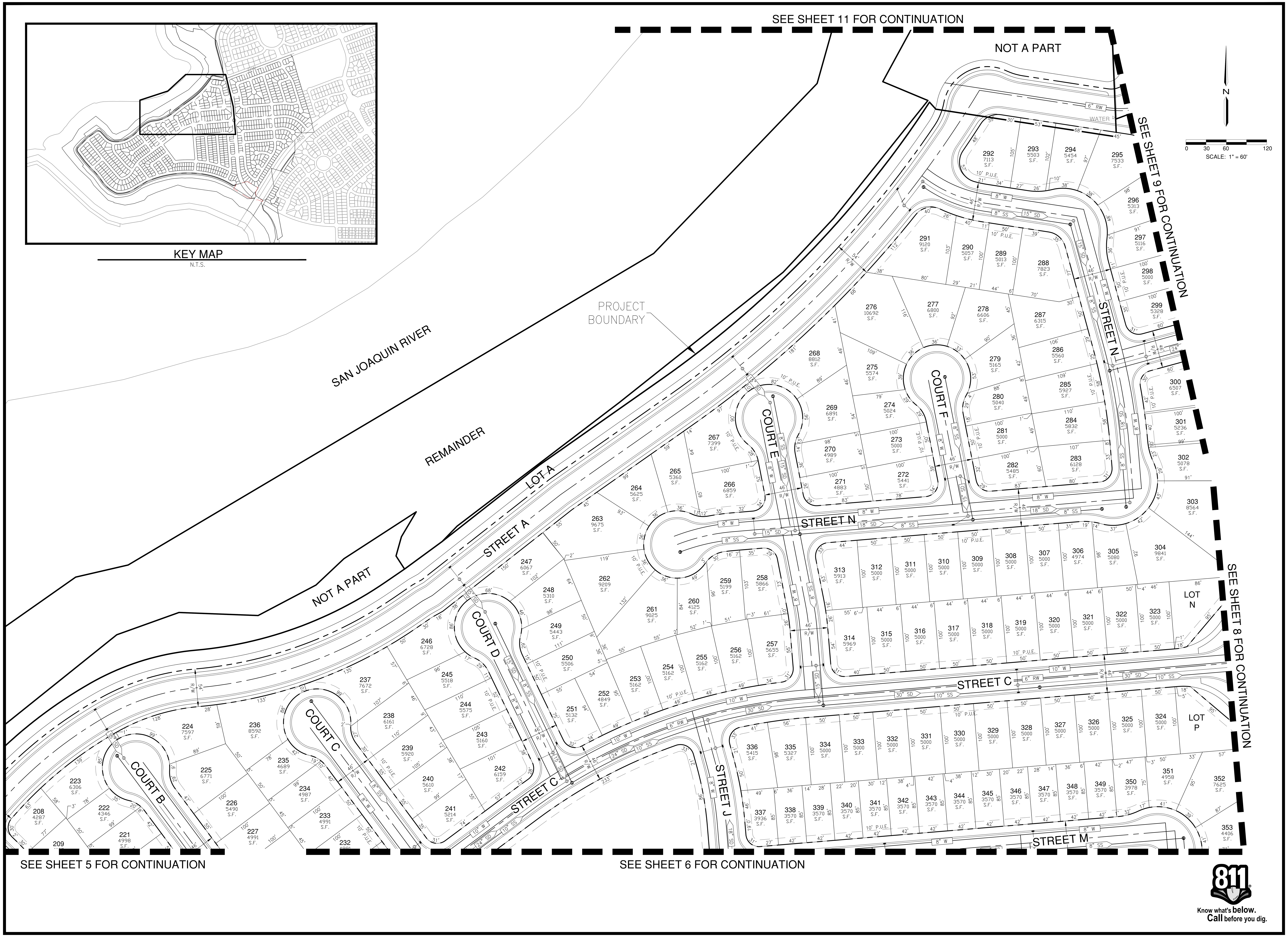
LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
9
OF
12

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg ehomed 14:32:14 02/14/2024



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

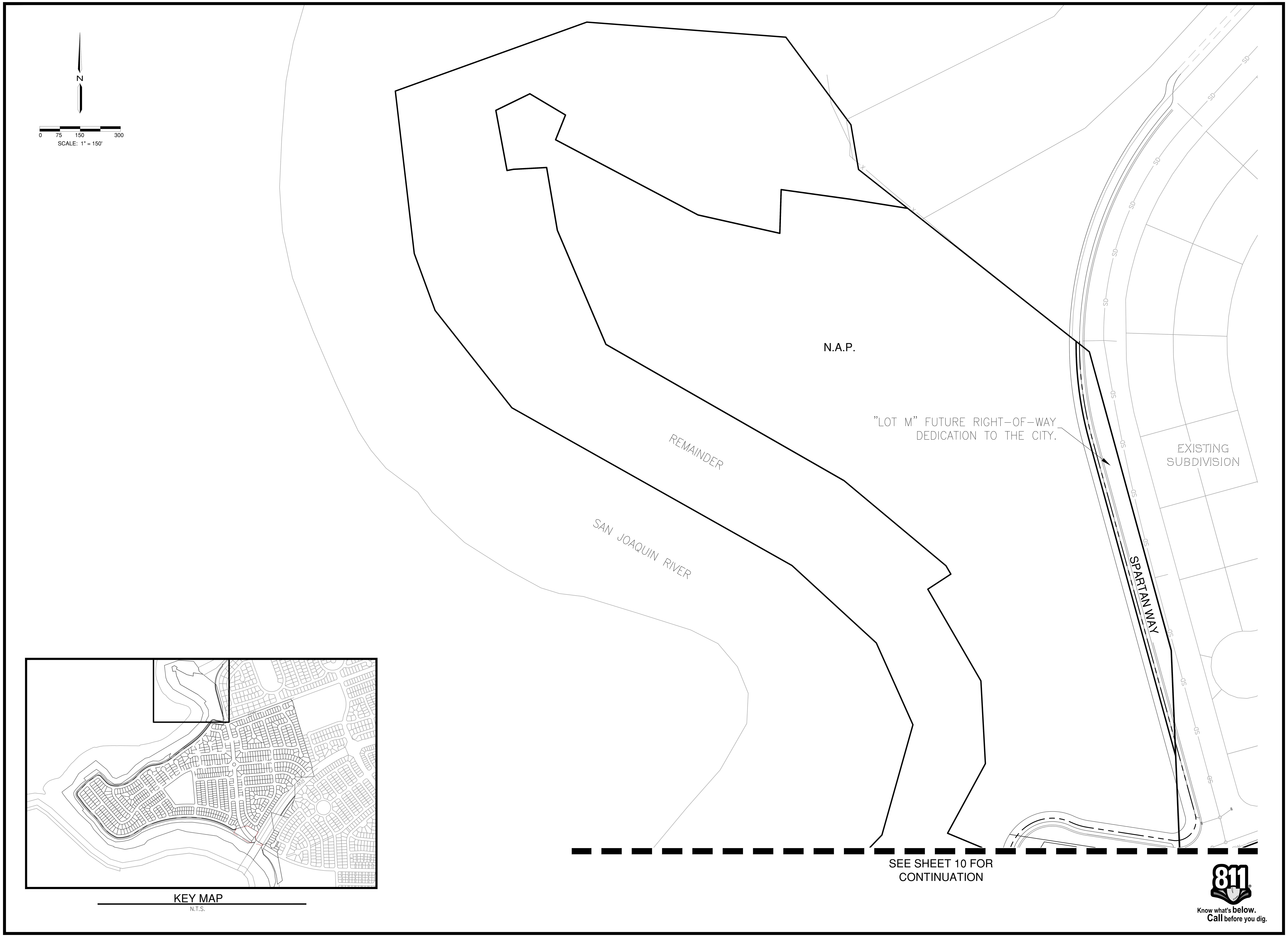
LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
10
OF
12

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg ehomed 14:16:14 02/14/2024



SEE SHEET 10 FOR
CONTINUATION

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

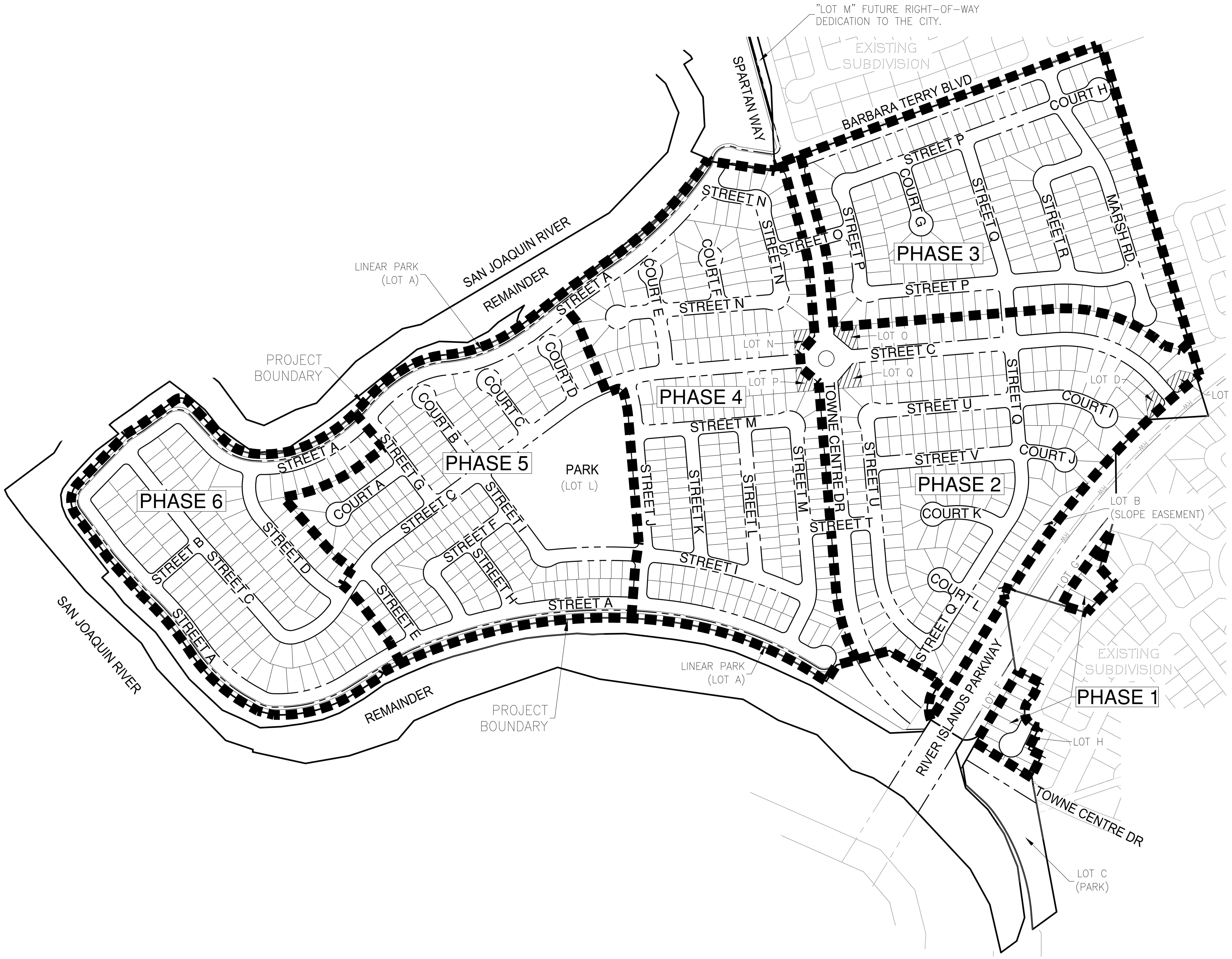
MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg ehamed 14:16:14 02/14/2024



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

PHASING PLAN

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	2/14/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
12
OF
12

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg ehomed 14:16:14 02/14/2024

APPENDIX H

IPaC Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
Phone: (916) 930-5603 Fax: (916) 930-5654

In Reply Refer To: 06/19/2024 17:10:13 UTC
Project Code: 2024-0106187
Project Name: Mossdale Landing West Specific Plan

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed, and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (https://www.fws.gov/program/eagle-management/working-around-eagles). Additionally, wind energy projects should follow the wind energy guidelines (https://www.fws.gov/node/266177) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at:https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation; and http://www.towerkill.com.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

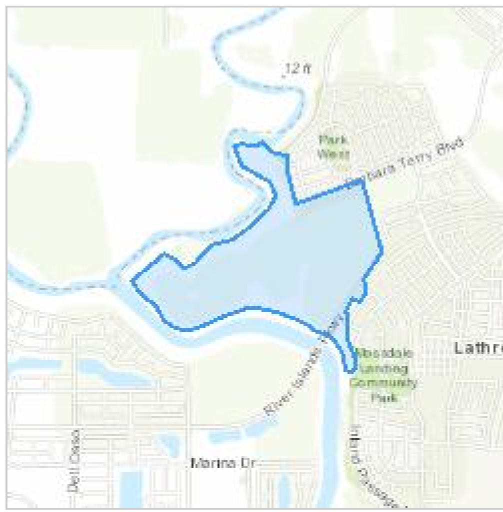
This species list is provided by:

San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
(916) 930-5603

PROJECT SUMMARY

Project Code: 2024-0106187
Project Name: Mossdale Landing West Specific Plan
Project Type: Residential Construction
Project Description: The Mossdale Landing West Specific Plan (Specific Plan or Project) would include the construction and associated operation of up to 912 residential units with associated park, circulation, and utility improvements over five phases.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.809597499999995,-121.3158167606485,14z



Counties: San Joaquin County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 10 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Riparian Brush Rabbit *Sylvilagus bachmani riparius* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6189	Endangered

REPTILES

NAME	STATUS
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

AMPHIBIANS

NAME	STATUS
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened
Western Spadefoot *Spea hammondii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5425	Proposed Threatened

FISHES

NAME	STATUS
Longfin Smelt *Spirinchus thaleichthys* Population: San Francisco Bay-Delta DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9011	Proposed Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850	Threatened

CRUSTACEANS

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

FLOWERING PLANTS

NAME	STATUS
Large-flowered Fiddleneck *Amsinckia grandiflora* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5558	Endangered

CRITICAL HABITATS

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* For information on why this critical habitat appears for your project, even though Delta Smelt is not on the list of potentially affected species at this location, contact the local field office. https://ecos.fws.gov/ecp/species/321#crithab	Final

IPAC USER CONTACT INFORMATION

Agency: Lathrop city
Name: Elise Laws
Address: 1020 Suncast Lane
Address Line 2: #106
City: El Dorado Hills
State: CA
Zip: 95762
Email elaws@denovoplanning.com
Phone: 9162350116

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Lathrop city

APPENDIX I

Storm Drain Capacity Analysis

DRAFT - Technical Memorandum

Date: 11/7/2024

To: Mr. Brad Taylor, P.E – City of Lathrop

From: Thomas Mihara, P.E.
Jenny Robinet, P.E.

Re: DRAFT - Technical Memorandum
Mossdale West Development Storm Drain Capacity Analysis

PACE Job Number: C336

1 Introduction

1.1 Background

The Mossdale West Development (Development) will be located within the City of Lathrop's (City) West Lathrop Specific Plan area, bounded by Barbara Terry Boulevard to the north, River Islands Parkway to the south, and the San Joaquin River to the West. The Development will primarily be a low-density residential community that includes 829 single-family lots on a 169-acre site. The Development will also feature a 6.2-acre park near the center of the subdivision and a 5.5-acre linear park along the perimeter of the site adjacent to the San Joaquin River. Various utilities such as storm drain (SD) systems will be expanded to serve the subdivision.

The Development was originally planned to be its own watershed designated as the M4 watershed within the Mossdale Landing Development in the early 2000s. However, the M4 watershed was not constructed with the surrounding Mossdale Landing Development.

The current 2022 City Design and Construction Standards (City Standards), have been updated to require the onsite SD detention basins, storm drain pump stations (SDPS), and corresponding forcemains to provide a capacity equal to the 100-year storm for a 24-hour duration, utilizing a total precipitation depth of 3.30 inches. Specifically, the SDPS and forcemains shall be designed to provide a firm pumping capacity capable of draining the entire 100-year, 24-hour storm event over a period of 96 hours. The updated 2022 City Standards are potentially less stringent than the original Mossdale M1 watershed design requirements, and therefore there may be additional capacity to handle the Development.

As shown in the Development's Vesting Tentative Map (see **Attachment A**), the Development is proposing to utilize the adjacent M1 watershed's SD system to service the SD needs of the project. The Development's stormwater (SW) runoff will sheet flow from each parcel to the street, where curb inlets and catch basins will capture the SW into a new SD system. The Development's SD system is proposing to connect to the City's existing Mossdale M1 watershed along Barbara Terry Blvd. From here the Mossdale M1 storm drain pump station (M1 SDPS) will discharge the collected runoff to the San Joaquin River. The next step for the project is determining the feasibility of utilizing the existing M1 watershed SD infrastructure to service the proposed Development.

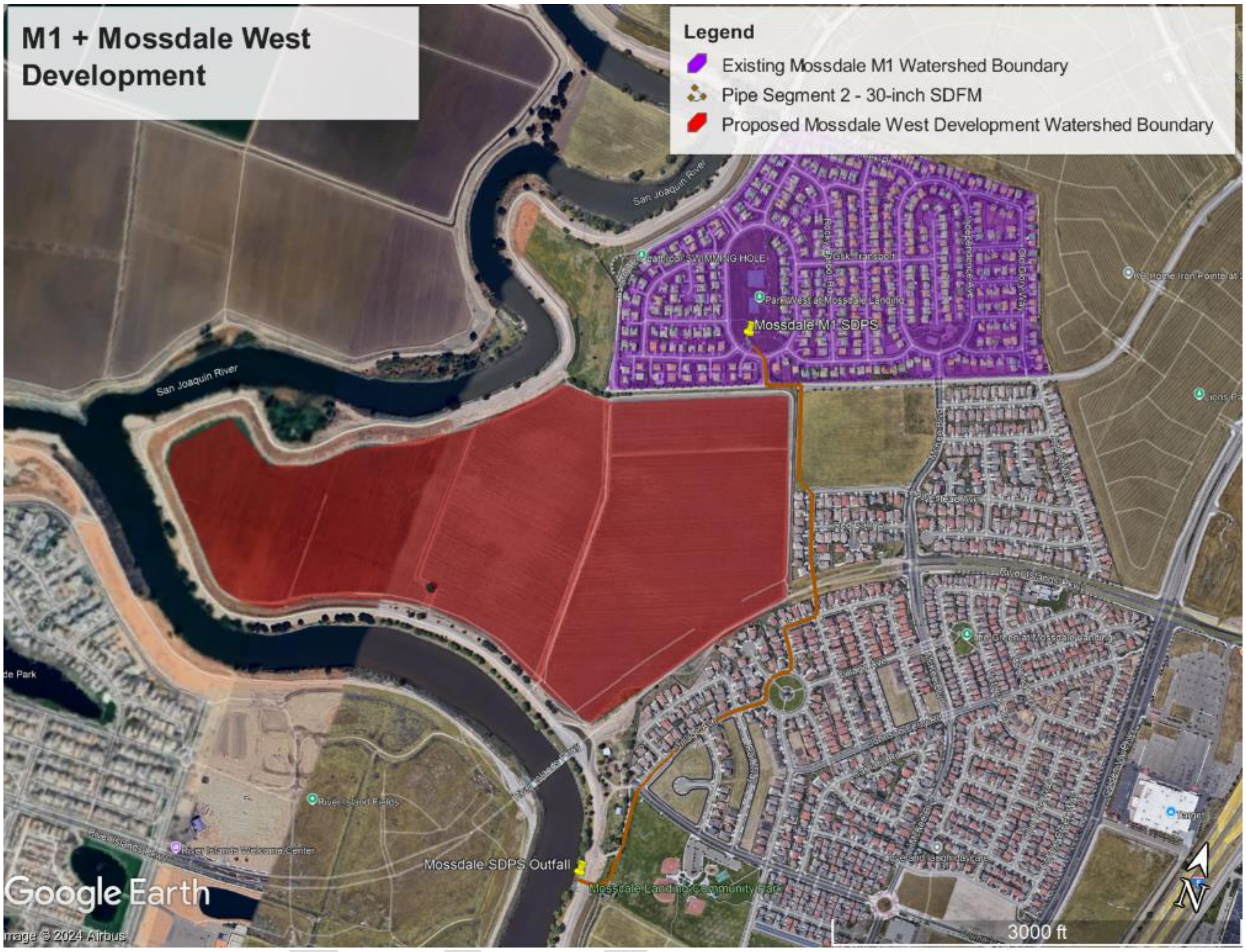


Figure 1: Existing Mossdale M1 + Proposed Mossdale West Development Watersheds

1.2 Relevant Technical Studies, Standards, and Reports

1.2.1 *Mossdale M1 Watershed As Built Drawings*

The City provided PACE with as built drawings of the existing M1 watershed SD infrastructure which served as the basis for PACE's SW model. Information such as the location, size, and elevation of SD infrastructure were extracted from the as built drawings and inputted into PACE's model.

1.2.2 *Mossdale Landing West – Vesting Tentative Map Tract 4146*

O'Dell Engineering, serving as the civil engineer for the Development, provided PACE with the Mossdale Landing West Tentative Map (**Attachment A**) showing the proposed M1 watershed storm drain points of connections. Additionally, since grading plans are not available for the project, in order to model the SW flows from the Development, PACE had to make assumptions on the produced runoff based on the different land uses shown within the tentative map (see **Section 3**).

1.2.3 *2022 City of Lathrop Design and Construction Standards*

The *2022 City of Lathrop Design and Construction Standards* (2022 City Standards) are intended to provide the minimum standards for all facilities and all appurtenances in the City of Lathrop. The City Standards were created to provide the minimum requirements for all facilities and appurtenances to be turned over to the City for operation and maintenance.

The 2022 City Standards were used to analyze the performance of the existing M1 SD infrastructure to service the Mossdale West Development (see **Section 2**).

1.3 Technical Memorandum Objectives

The objectives of this Technical Memorandum are as follows:

- Model and determine the peak SW runoff flows within the existing M1 and proposed Mossdale West watersheds under a 10-year, 24-hour storm event. Calculate the hydraulic grade lines (HGL) within the existing M1 SD system to determine the feasibility of utilizing the existing M1 watershed SD infrastructure (see **Sections 3** & **4**).

- Model and determine the peak SW runoff flows and total storm volume of the existing M1 and proposed Mossdale West watersheds under a 100-year, 24-hour storm events. Calculate the required storage and HGL within the existing M1 SD system to determine the feasibility of utilizing the existing M1 watershed SD infrastructure (see **Sections 3** & **4**).

- Determine the capacity of the existing M1 SDPS and forcemains and verify if there is sufficient capacity for the Development in accordance with the 2022 City Standards (see **Section 5**).

- If the analysis determines the existing storm drainage system does not have sufficient capacity for the Development, provide recommended improvement options in accordance with the 2022 City Standards (see **Section 6**).

2 2022 City of Lathrop Design and Construction Standards

The City of Lathrop has published the 2022 Design and Construction Standards (2022 City Standards) which are intended to serve as the minimum design requirements for all infrastructure to be owned and operated by the City. Section 3 and Appendix H within the 2022 City Standards establishes the minimum requirements for the design and construction of all storm drainage infrastructure including but not limited to the following items below used in this analysis.

2.1 Definitions

2.1.1 *10-Year, 24-Hour Storm Event*

A 10-year, 24-hour storm event is defined within the 2022 City standards as a storm with a total precipitation depth of 2.35-inches. All newly constructed storm drainage systems shall have sufficient capacity to convey 10-year, 24-hour storm events as defined below for the purposes of minimizing inconvenience, protection against minor damage, and to reduce maintenance costs.

2.1.2 *Flood Protection Level*

The Flood Protection Level (FPL), is defined as the development of flood protection facilities equivalent to a 100-year or 200-year storm frequency. The level of protection shall be determined by the Director of Public Works or the applicable governing body.

For the purposes of this analysis, the FPL design storm frequency is assumed to be a 100-year storm matching what the existing Mossdale M1 infrastructure was designed for.

2.1.3 *100-Year, 24-Hour Storm Event*

The 2022 City Standards define a 100-year, 24-hour storm event with a total precipitation depth of 3.30-inches. Both the Mossdale M1 and the Development's SD infrastructure must have sufficient capacity as defined in the sections below for a 100-year, 24-hour storm event for the purposes of protecting against loss of life or substantial property damage.

2.2 Gravity Storm Drainage Systems – Allowable Hydraulic Grade Line

2.2.1 *10-Year, 24-Hour Storm Event*

Per Section 3-6.2 in the 2022 City Standards, during a 10-year, 24-hour storm event, the calculated hydraulic grade line (HGL) in each SD pipe must be a minimum of 1 foot below the elevation of all the inlet grates and manhole covers within the system. In other words, during a 10-year, 24-hour storm, the capacity of each SD lines shall be sufficient to produce a HGL in the SD system, a minimum of 1-foot below the elevation of inlet grates and manhole covers.

2.2.2 *100-Year, 24-Hour Storm Event*

Per Section 3-6.2 in the 2022 City Standards, the calculated HGL during a FPL storm (100-year, 24-hour storm event) is allowed to surcharge beyond the capacity of the gravity storm drainage system as long as the HGL does not extend beyond public right of way.

2.3 Gravity Storm Drainage Systems – Maximum Pipe Velocities

Per Section 3-6.2 in the 2022 City Standards, the maximum pipe velocity in the collection system during a 100-year, 24-hour storm event shall not exceed 20 feet per second. This includes conditions where the calculated HGL is above the top of pipe, and pressurized pipe flow conditions occur.

2.4 Storm Drain Detention Basins – Required Detention Volume

Per Section 3-7.7 in the 2022 City Standards, all onsite storm drain detention basins are required to provide sufficient volume based on the runoff generated within the watershed from a FPL storm (100-year, 24-hour).

2.5 Mossdale M1 Storm Drain Pump Station – Firm Pumping Capacity Requirements

Because the Mossdale M1 watershed is equipped with a detention system, Section 3-7.7 in the 2022 City Standards requires the Mossdale M1 SDPS to be equipped with a firm pumping capacity capable of evacuating the FPL storm volume (100-year, 24-hour storm) over a maximum period of 96 hours. Firm pumping capacity is defined within the 2022 City Standards as the total pumping capacity of all the pumps minus the capacity of the largest pump.

2.6 Mossdale M1 Storm Drain Pump Station – Minimum and Maximum Force Main Velocity

Appendix H of the 2022 City Standards requires that all SD force mains (SDFM) be designed to comply with the following operating velocities

- Minimum SDFM velocity shall be 2 feet per second (fps) with the connecting pumps capable of providing 3.5 fps to help re-suspend and clean the SDFMs

- The maximum SDFM velocity shall be limited to 10 fps.

2.7 Mossdale M1 Storm Drain Pump Station – Flow Capacity of Trash Rack/Screen

All storm drain pump stations are required to be equipped with a trash screening device with a rated flow capacity greater than or equal to the firm pumping capacity of the pump station. At a minimum, the velocity through the screen shall not exceed 1 fps under any operating condition unless otherwise noted by the screen manufacturer.

3 Stormwater Modeling Approach and Assumptions

3.1 Modeling Software

The following sections are intended to summarize the two different modeling software used in this analysis.

3.1.1 *Hydrology Modeling Software*

The 2022 City Standards require hydrologic modeling to follow the methodology described in the County of San Joaquin Hydrology Manual, September 1997, First Draft. Per the Hydrology Manual, the rational method can be used to calculate peak flows using the rational method, or the unit hydrograph method can be used to calculate hydrographs using TR-20, TR-55, or HEC-1. Since the size of the contributing watershed is less than 640 acres (less than 1 square mile), the rational method was an appropriate method to use for the project.

The rational method was completed using the hydrologic software program AES, a computer-aided watershed modeling program that is widely accepted in numerous counties in California. The software comes pre-loaded with the San Joaquin County approved Rational Method and Unit Hydrograph modules. The modeler is required to enter hydrologic parameters, such as rainfall, soil, land use, and elevation data, and the software processes the data according to the prescribed SJC Hydrology Manual.

AES was selected for use based on the following:

- It provides rational method calculations incorporating peak intensities for complex and extensive systems.
- It has pre-loaded San Joaquin County modules which directly follow the County's Hydrology Manual.

The rational method relates rainfall intensity, a runoff coefficient, and drainage area size to yield direct peak runoff from the drainage area. There is no direct time factor involved in the calculations as it is assumed that all runoff arrives to the point of interest at the same time, unlike the unit hydrograph method which estimates the time distribution of watershed runoff from the drainage area. The rational method is a more conservative approach and appropriate for smaller watersheds.

Within the AES rational method module, there is a File Network Management Module (FNM) that links individual sub-watersheds together so that a continuous rational method model can be built with all tributary watersheds included. The FNM module uses .dna files which are used to transfer hydrologic information from upstream sub-watersheds to downstream sub-watersheds. This allows linking individual sub-watersheds one at a time instead of rebuilding a new model from the beginning each time a sub-watershed is added to the study. Since the watershed had a very detailed drainage system, the hydrologic model was prepared by splitting the drainage area into four systems, and linked through the FNM within AES.

AES provided the following results:

- 10-year & 100-year SW runoff flowrates
- 10-year & 100-year storm drain pipe velocities
- 10-year & 100-year hydraulic grade lines (pipe capacities)

The AES results were analyzed, and certain links within the system were hydraulically modeled for further evaluation.

3.1.1.1 *Rainfall Input*

The 2022 City Standards require the use for precipitation depths at the 24-hr to be used for analysis of the 10- and 100-year storm events (see **Section 2.1**). However, the rational method calculates peak runoff using intensities. Intensity-duration-frequency tables (Table B.10 and Table B.13) listed in the San Joaquin Hydrology Manual were used as inputs for the hydrologic modeling. The intensity-duration-frequency values were chosen based on the depth-duration-frequency values for Map 14. These map values correspond to the City's required precipitation depth at the 24-hr. This is a more conservative approach since the 24-hr intensity would produce the required 24-hr precipitation depth.

3.1.2 *Storm Drain Collection System Modeling Software*

The City's Standards have specific pipe flow criteria requirements for storm drain systems, including maximum HGL elevations (see **Section 2.2**). Based on the results from the AES hydrologic model, hydraulic models were prepared for links within the system which were showing full capacity (pressurized flow) to determine if the City's Standard requirements were still met. The hydraulic software XPSWMM, was used to determine the HGL of the system. Hydraulic input parameters included flow rates, pipe dimensions, elevation data, stage-storage curve and pump curves. The XPSWMM model was used to calculate the corresponding HGL's in the system and if it exceeded the 2022 City Standards.

3.2 Existing M1 Watershed Stormwater Modeling Approach and Assumptions

The following sections are intended to summarize the modeling approach and assumptions used in the analysis of the existing M1 Watershed.

3.2.1 *Existing M1 Watershed SD Collection System*

The model of the M1 watershed SD collection system was based on the following as built provided by the City.

- Improvement Plans Tract 3401 Mossdale Landing – Phase II
- Street Improvement Plans Tract 3468 Mossdale Landing – Unit 5A
- Improvement Plans Tract 3411 Mossdale Landing – Village 5B
- Improvement Plans Tract 3412 Mossdale Landing – Village 6

Specifically, the following information was extracted from the as built drawings and inputted into PACE's model for the analysis.

- SD pipe sizes
- SD invert elevations and alignment
- Rim elevations for all SD manholes
- Top of grating elevations for all catch basins
- Public right-of-way limits
- Finished grades

MOSSDALE WEST

M1 WATERSHED EXISTING STORM DRAINS

PACE Advanced Water Engineering

0 150 300 600 Feet

Date: 10/18/2024

Job Number: C336

Figure 2

3.2.2 *Existing M1 Watershed Stormwater Runoff and Conveyance*

To calculate the SW runoff from the M1 watershed and determine the conveyance route to the M1 SDPS, the existing M1 watershed was divided into smaller drainage areas (sub-watersheds) no more than 3-acres in size. The boundaries of each sub-watershed was based on the location of high and low points (see figures within **Section 4**). SW from each sub-watershed was calculated utilizing rational method and conveyed into the SD collection system based on the location of adjacent curb inlets or catch basins. From here SW would ultimately be conveyed to the M1 SDPS through the underground SD collection system or above ground within the public right-of-way (ROW).

3.2.3 *Existing M1 Watershed Underground Detention System*

The existing M1 watershed is provided with an underground SW detention system, adjacent to the Mossdale M1 SDPS, and located beneath Park West at Mossdale Landing. Currently there are no as built drawings of the underground detention system, however the as built drawings for Tract 3401 indicate the detention system consist of a series of corrugated metal pipes. For the purposes of this analysis, the system shown in the Tract 3401 as built drawings was inputted into the model with the following specifications.

Table 3-1: Mossdale M1 – Existing Underground Detention System

Parameter	Value
Diameter of Corrugated Metal Pipes	120-inches
Total Number of Corrugated Metal Pipes	6
Length of Corrugated Metal Pipes	550 feet
Approximate CMP Detention Volume[1]	6.0 acre-ft
Approximate Pea Gravel Detention Volume[2]	0.3 acre-ft
Approximate Total Detention Volume	**6.3 acre-ft**

Notes
1. Based on the system shown in the Tract 3401 as built drawings
2. Assuming the peak gravel has an approximate 40% void (storage) area.

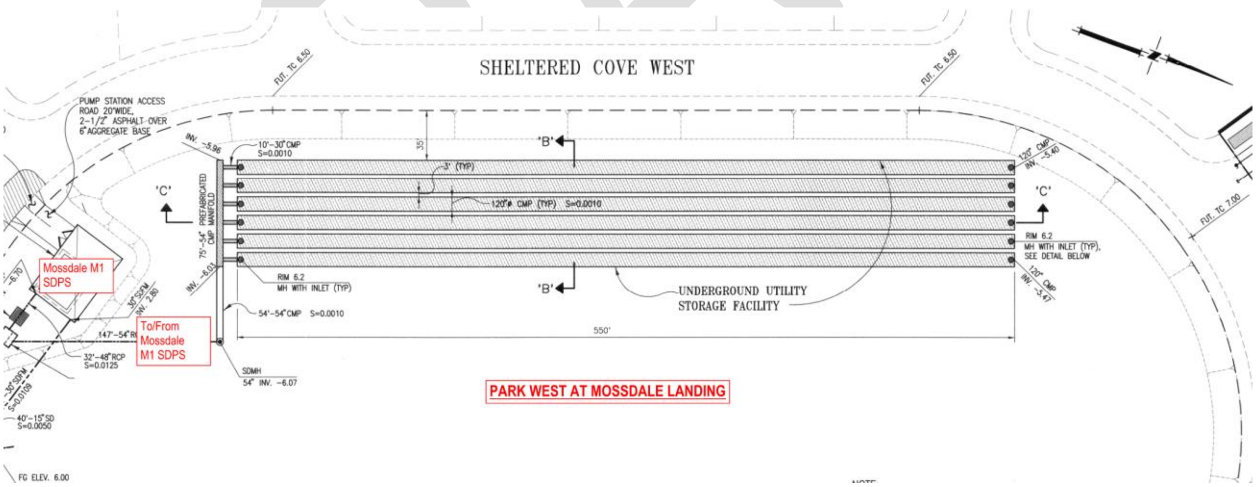


Figure 3: Existing M1 Watershed – CMP Underground Detention System – Tract 3401 As Builts

3.2.4 *Existing M1 Watershed Storm Drain Pump Station*

All stormwater from the M1 watershed is conveyed by gravity to the M1 SDPS located within the Park West and adjacent to the underground detention system mentioned above. To be described further in **Section 5**, the existing M1 SDPS is equipped with seven submersible pumps designed to evacuate SW from the watershed in a staggered configuration. The pump curves of the specified pumps along with the operating water levels for each pump were inputted into the model.

If the influent SW flow exceeded the pumping capacity of the M1 SDPS, SW flows were modeled to be automatically diverted to the underground detention system when the HGL exceeded an elevation of 1.00 feet. As shown in the figure below, the M1 SD collection system has an automatic overflow design to divert excess SW when the HGL in the system exceed 1.00 feet. The model was updated to allow for the SDPS to drain the detention basin when the HGL dropped below an elevation of -6.20 feet as shown below.

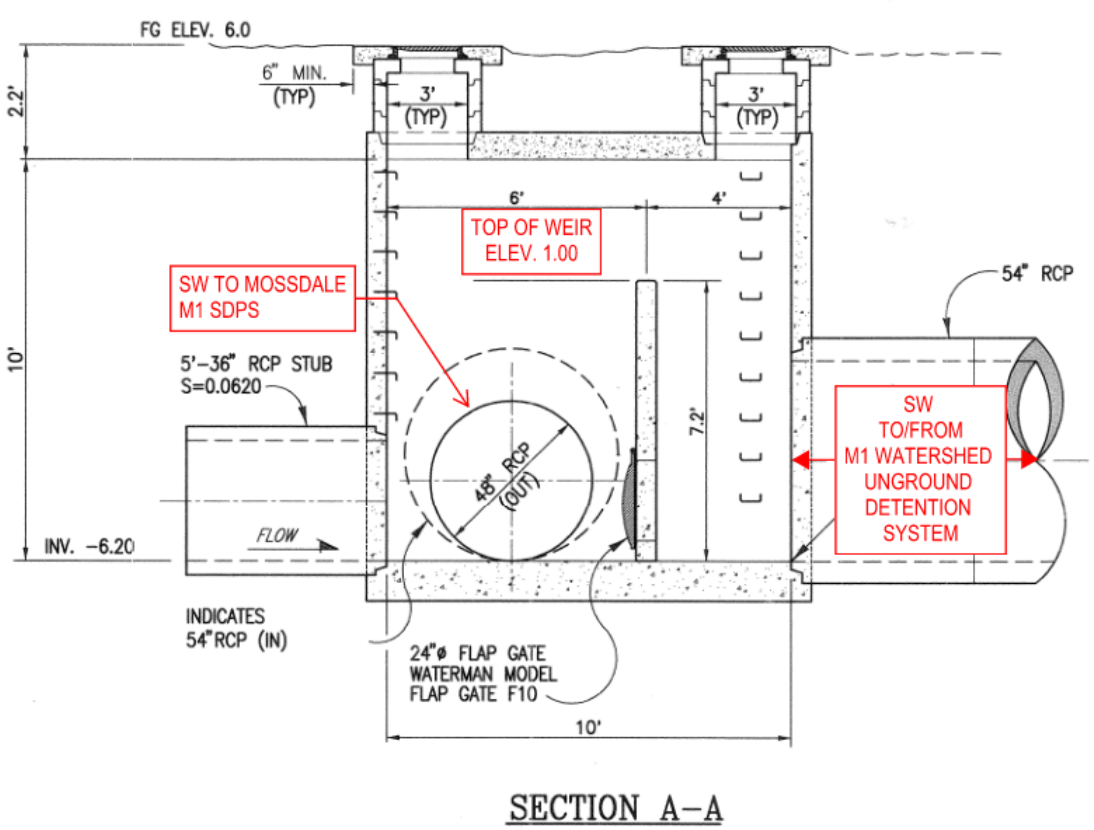


Figure 4: Existing M1 Watershed Diversion Structure

3.3 Mossdale West Development Stormwater Modeling Approach and Assumptions

In order to determine the actual SW runoff from a watershed, information such as proposed lot and street grades, as well as the relevant SD invert and rim elevations are required. This information is usually provided from a Development's grading and wet utility improvements plans which have not been completed at the time of this analysis. Since the Development is still at the preliminary planning phases, for the purposes of verifying the feasibility of utilizing the existing M1 SD infrastructure, the following sections summarizes the assumptions were used to model the Development.

3.3.1 *Stormwater Runoff for Mossdale West Development*

The Development will have a similar area, land use, and adhere to the same City design standards for parcel and street improvements as the existing M1 watershed. Therefore, the Development's SW runoff was calculated utilizing the same variables as the M1 watershed. The table below shows the average M1 watershed SW runoff generated for a 10-year and 100-year 24-hour storm event. These average SW runoff rates were applied to the Development for the purposes of calculating the Development's runoff flows.

Table 3-2:Mossdale M1 Watershed – Average Stormwater Runoff Rates

Storm Event	Mossdale M1 Watershed Average Stormwater Runoff Rates
10-year, 24-hour storm event	0.73 cfs/acre
100-year, 24-hour storm event	1.28 cfs/acre

3.3.2 *M1 Storm Drain Points of Connection for Mossdale West Development*

The Development's Tentative Map shows a single point of connection to the existing M1 SD infrastructure located at the intersection of Marsh Road and Barbara Terry Boulevard. However, in addition to the intersection above, the Development will also connect to the M1 watershed at W Street (connects to Spartan Way). In the future, the Development's excess stormflows could utilize the public ROW along W street to enter the M1 watershed.

Since the Development grading and street improvement plans are unknown, PACE is unable to determine what portion of flow could be diverted to W Street to alleviate the load along Marsh Road. In order to provide a more conservative analysis, PACE assumed all SW flows, including excess flows conveyed by the public ROW will enter the M1 watershed at the intersection of Marsh Road and Barbara Terry Boulevard.

4 Stormwater Modeling Results

4.1 Existing M1 Watershed Only

The following section summarizes the modeling results for the existing M1 watershed only under the current 2022 City Standards. The purpose for modeling the existing M1 watershed is to verify the Development's impact on the performance of the existing SD infrastructure.

Figure 5 & **Figure 6** below shows the modeling results of existing M1 watershed under a 10-year, 24-hour storm event with **Table 4-1** summarizing the requirements of the 2022 City Standards. As shown below, the existing M1 watershed was modeled to successfully pass the 2022 City Standards requirements listed below.

Table 4-1: Existing M1 Watershed Modeling Results – 10-Year, 24-Hour Storm Event

2022 City Standards Category	2022 City Standards Requirement	Meets 2022 City Standards?	Location
Maximum Hydraulic Grade Line *Section 3-6.2*	The HGL shall be a minimum of 1 foot below the elevation of the inlet grates and manholes covers of all structures within the SD system	Yes	N/A
Maximum Pipe Velocity *Section 3-6.2*	20 feet per second	Yes	N/A

Figure 7 & **Figure 8** below shows the modeling results of existing M1 watershed under a 100-year, 24-hour storm event with **Table 4-2** summarizing the requirements of the 2022 City Standards.

During a 100-year, 24-hour storm event, the existing M1 watershed SD collection system is unable to meet all of the 2022 City Standards before the addition of the Mossdale West Development. The model results indicated the biggest restriction is the insufficient SW detention volume as this leads to an increase in the HGL throughout the watershed. The rise in the HGL results in flooding beyond the public ROW in the eastern region of the M1 watershed.

Table 4-2: Existing M1 Watershed Modeling Results – 100-Year, 24-Hour Storm Event

2022 City Standards Category	2022 City Standards Requirement	Meets 2022 City Standards?	Location
Maximum Hydraulic Grade Line *Section 3-6.2*	The HGL shall be within the street ROW	No	• 18-inch – Historic Ave. • 18-inch – Independence Ave. • 24-inch – Independence Ave. • 30-inch – Independence Ave.
Maximum Pipe Velocity *Section 3-6.2*	20 feet per second	Yes	N/A
Detention Basin Storage Volume Section *Section 3-7.7*	Sufficient volume to store entire 100-year, 24-hour storm volume?	No	• Existing M1 watershed has an approx. storage capacity of 6.3 acre-feet. • Existing M1 watershed 100-year, 24-hour storm volume is 21.2 acre-feet exceeding the existing capacity

W:\C336\GIS\Projects\C336_Mossdale\C336_Mossdale.aprx - Existing M1 Watershed 10YR 24HR Flow Rates

MOSSDALE WEST

EXISTING M1 WATERSHED
10-YEAR, 24-HOUR FLOW RATES

PACE Advanced Water Engineering

0 150 300 600 Feet

Date: 10/18/2024

Job Number: C336

Figure 5

W:\C336\GIS\Projects\C336_Mossdale\C336_Mossdale.aprx - Existing M1 Watershed 10YR 24HR Velocity

MOSSDALE WEST

EXISTING M1 WATERSHED
10-YEAR, 24-HOUR VELOCITIES

PACE Advanced Water Engineering

0 150 300 600 Feet

Date: 10/18/2024

Job Number: C336

Figure 6

W:\C336\GIS\Projects\C336_Mossdale\C336_Mossdale.aprx - Existing M1 Watershed 100YR 24HR Flow Rates

MOSSDALE WEST

EXISTING M1 WATERSHED
100-YEAR, 24-HOUR FLOW RATES

PACE Advanced Water Engineering

0 150 300 600 Feet

Date: 10/18/2024

Job Number: C336

Figure 7

W:\C336\GIS\Projects\C336_Mossdale\C336_Mossdale.aprx - Existing M1 Watershed 100YR 24HR Velocity

MOSSDALE WEST

EXISTING M1 WATERSHED
100-YEAR, 24-HOUR VELOCITIES

PACE Advanced Water Engineering

0 150 300 600 Feet

Date: 10/18/2024

Job Number: C336

Figure 8

4.2 Existing M1 + Mossdale West Development Watersheds

Figure 9 & **Figure 10** below shows the modeling results of existing M1 watershed with the addition of the Mossdale West Development under a 10-year, 24-hour storm event. As shown in **Table 4-3**, the existing M1 infrastructure is capable of meeting the 2022 City Standards during a 10-year, 24-hour storm event.

Table 4-3: Existing M1 + Mossdale West Watershed Modeling Results – 10-Year, 24-Hour Storm Event

2022 City Standards Category	2022 City Standards Requirement	Meets 2022 City Standards?	Location
Maximum Hydraulic Grade Line *Section 3-6.2*	The HGL shall be a minimum of 1 foot below the elevation of the inlet grates and manholes covers of all structures within the SD system	Yes	N/A
Maximum Pipe Velocity *Section 3-6.2*	20 feet per second	Yes	N/A

As described in **Section 4.1**, during a 100-year, 24-hour storm event, the existing SD collection system does not meet the performance requirements of the 2022 City Standards. With the addition of the Mossdale West Development, the existing SD collection system will see additional flooding areas along Marsh Road where the HGL will exceed beyond the street ROW. Additionally, the storage capacity of the existing underground detention system will be insufficient to store the entire 100-year, 24-hour storm event as required in Section 3-7.7 in the 2022 City Standards.

Table 4-4: Existing M1 + Mossdale West Watershed Modeling Results – 100-Year, 24-Hour Storm Event

2022 City Standards Category	2022 City Standards Requirement	Meets 2022 City Standards?	Location
Maximum Hydraulic Grade Line *Section 3-6.2*	The HGL shall be within the street ROW	No	• 18-inch – Historic Ave. • 18-inch – Independence Ave. • 24-inch – Independence Ave. • 30-inch – Independence Ave. • 48-inch – Marsh Road • 48-inch – Sheltered Cove West
Maximum Pipe Velocity *Section 3-6.2*	20 feet per second	Yes	N/A
Detention Basin Storage Volume Section *Section 3-7.7*	Sufficient volume to store entire 100-year, 24-hour storm volume?	No	• Existing M1 watershed has an approx. storage capacity of 6.3 acre-feet. • Existing M1 plus the proposed Mossdale West Watersheds 100-year, 24-hour storm volume is 60 acre-feet exceeding the existing capacity

<LINK>W:\C336(GIS)\Projects\C336_Mossdale\C336_Mossdale.aprx</LINK> - Existing M1 & Proposed M4 10YR 24HR Flow Rates

MOSSDALE WEST

EXISTING MOSSDALE M1 AND PROPOSED M4 WATERSHEDS
10-YEAR, 24-HOUR FLOW RATES

PACE Advanced Water Engineering

0 250 500 1,000 Feet

Date: 10/18/2024

Job Number: C336

Figure 9

<LINK>W:\C336\GIS\Projects\C336_Mossdale\C336_Mossdale.aprx</LINK> - Existing M1 & Proposed M4 10YR 24HR Velocity

MOSSDALE WEST

EXISTING MOSSDALE M1 AND PROPOSED M4 WATERSHEDS
10-YEAR, 24-HOUR VELOCITIES

PACE Advanced Water Engineering

0 250 500 1,000 Feet

Date: 10/18/2024

Job Number: C336

Figure 10

MOSSDALE WEST

EXISTING MOSSDALE M1 AND PROPOSED M4 WATERSHEDS 100-YEAR, 24-HOUR FLOW RATES

PACE Advanced Water Engineering

0 250 500 1,000 Feet

Date: 10/18/2024

Job Number: C336

Figure 11

<LINK>W:\C336(GIS)\Projects\C336_Mossdale\C336_Mossdale.aprx</LINK> - Existing M1 & Proposed M4 100YR 24HR Flow Rates

MOSSDALE WEST

EXISTING MOSSDALE M1 AND PROPOSED M4 WATERSHEDS 100-YEAR, 24-HOUR VELOCITIES

0 250 500 1,000 Feet

Date: 10/18/2024

Job Number: C336

PACE Advanced Water Engineering

Figure 12

5 Capacity Analysis of Mossdale M1 Storm Drain Pump Station

5.1 Background

The existing Mossdale M1 watershed is equipped with a SDPS installed along the southern edge of Park West at Mossdale Landing (see **Figure 13**). Originally constructed in 2004, the Mossdale M1 SDPS is installed at the lowest point in the SD collection system and is designed to evacuate all of the stormwater runoff from the M1 watershed to the San Joaquin River through a dedicated 30-inch storm drain force main (SDFM). The SDPS consists of a belowground concrete wet well and an above ground enclosed area housing the individual pumps discharge piping and electrical components.

As shown in the figure below, the wet well is separated into two compartments. Stormwater enters the wet well and is screened of large objects and trash through a mechanically cleaned trash screen. During dry weather conditions, the low flow stormwater pump is responsible for pumping all dry weather stormwater to the San Joaquin River through the 30-inch SDFM. If SW flows exceed the capacity of the low-flow pump, SW will enter the larger wet well where six submersible SW EVAC pumps will evacuate the stormwater flows in a 5+1 standby configuration, operating in parallel. During utility power failure events, the station is equipped with a 600kW diesel fueled generated sized for all the required loads of the SDPS.

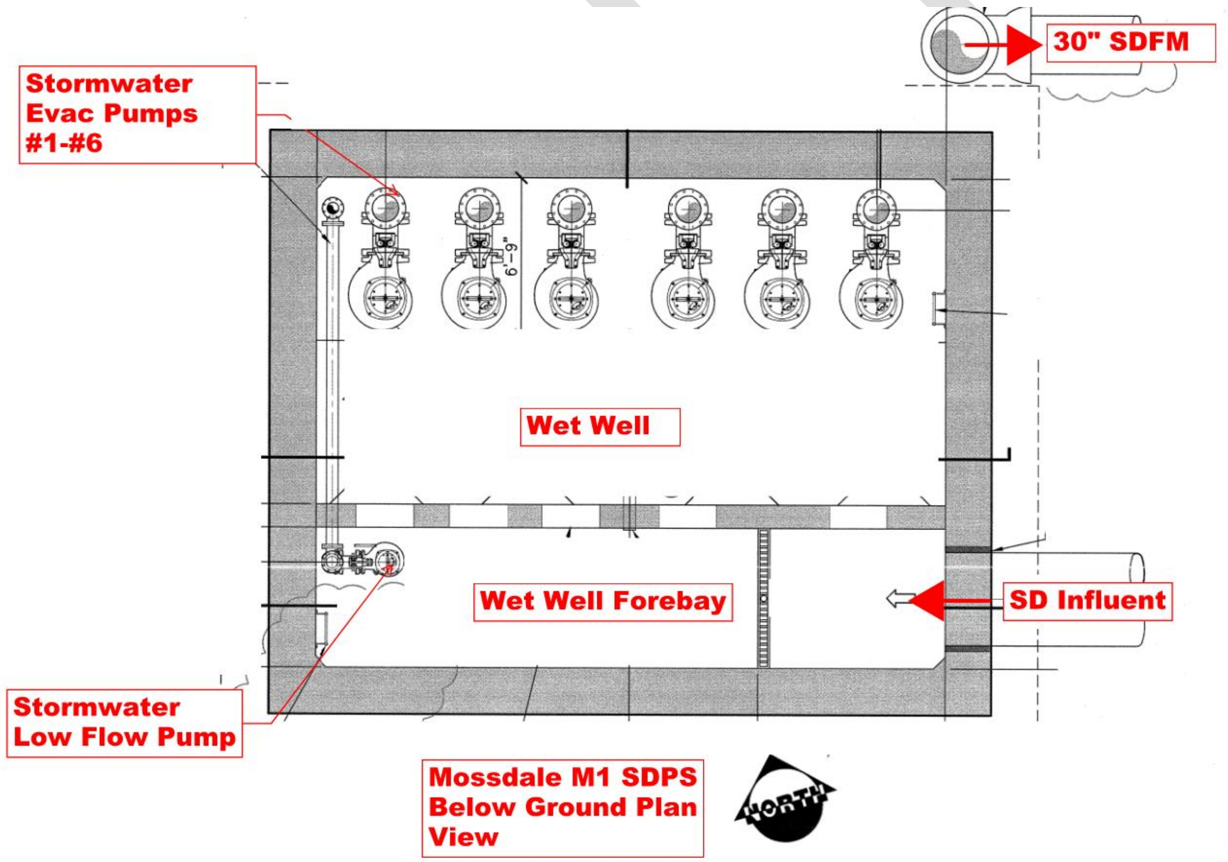


Figure 13: Existing Mossdale M1 SDPS Wet Well Plan View

5.2 Firm Pumping Capacity Requirements

As described in **Section 2.5**, the 2022 City Standards requires Mossdale M1 SDPS to be equipped with a firm pumping capacity capable of evacuating the FPL storm volume (100-year, 24-hour storm) over a maximum period of 96 hours. Firm pumping capacity is defined as the total pumping capacity of all the pumps minus the capacity of the largest pump.

PACE's stormwater model of the existing Mossdale M1 and proposed Mossdale West Watersheds determined that the total 100-year, 24-hour storm volume is 21.20 and 38.80 acre-feet respectively. Therefore, in accordance with the 2022 City Standards, the **Mossdale M1 SDPS must have a minimum firm pumping capacity of 7.56 CFS or 3,395 GPM.**

Table 5-1: Mossdale M1 – Firm Pumping Capacity Requirement

Parameter	Value
M1 Watershed 100-year, 24-hour Storm Volume	21.20 acre-ft
Mossdale West Watershed 100-year, 24-hour Storm Volume	38.80 acre-ft
Total M1+Mossdale West Watershed 100-year, 24-hour Storm Volume	**60.00 acre-ft**
M1 SDPS Firm Pumping Capacity Requirement	**7.56 cfs** **3,395 gpm**

5.3 Existing Mossdale M1 SDPS and SDFM Capacity Analysis

PACE conducted hydraulic calculations (see **Attachment B**) for the purposes of verifying the existing pumping capacity of the Mossdale M1 SDPS. The following assumptions where used in the hydraulic calculations.

- Based on the as built drawings provided by the City, the SDFM is constructed out of C900 PVC with a dimension ratio of DR-25.

- The 30-inch SDFM alignment is approximately 1.02 miles long. Finished grades were determined from Google Earth as shown in **Figure 1** and verified the highest point in the system is at the Mossdale SDFM outfall along the San Joaquin River.

- The as built plans shows 6 submersible, stormwater evacuation pumps manufactured by Flygt (model number NP3201.090 LT 63-624-3120). However, PACE's, the manufacturer, and ConcoWest (contractor who built the SDPS) records indicate a different Flygt pump was installed from the as built drawings (model number NP 3301 LT 3~624). Therefore, the factory curves for the NP 3301 LT 3~624 pumps were utilized in this analysis.

As shown in **Figure 14** and **Table 5-2**, the Mossdale M1 SDPS has the SW evacuation pumping capacity ranging from 1,400 GPM (1 low-flow pump running) to 15,812 GPM (5 SW Evac pump + Low Flow Pumps running in parallel). **Therefore, the Mossdale M1 SDPS has a firm pumping capacity of 15,812 GPM (35 cfs) which meets the minimum requirements of the 2022 City Standards.**

The original Mossdale M1 SDPS was originally designed to provide a firm pumping capacity equal to 30% of the peak 100-year runoff rate from the M1 watershed, roughly equal to 40 cfs. This is significantly higher than the current requirements within the 2022 City Standards which require the SDPS to have a firm pumping capacity capable of draining the entire 100-year, 24-hour storm event over a period of 96 hours.

Table 5-2: Existing M1 SDPS – Firm Pumping Capacity Results

Pump Number	Design Pumping Capacity	Motor Rated Horsepower	Motor Drive	Status
Low-Flow SW Pump #1	1,400 GPM	20	Motor Starter	Lead
SW Evac. Pump #1	2,883 GPM	85	Soft Starter	Lead
SW Evac. Pump #2	2,883 GPM	85	Soft Starter	Lag1
SW Evac. Pump #3	2,883 GPM	85	Soft Starter	Lag2
SW Evac. Pump #4	2,883 GPM	85	Soft Starter	Lag3
SW Evac. Pump #5	2,883 GPM	85	Soft Starter	Lag4
SW Evac. Pump #6	2,883 GPM	85	Soft Starter	Standby
Mossdale M1 SDPS Firm Pumping Capacity[2]	**15,812 GPM (35 cfs)**			
Firm Pumping Capacity Requirement[1]	**3,395 GPM (7.56 cfs)**			
Meets 2022 City Standards?	**Yes**			

Notes
1. Based on Section 3-7.7 in the 2022 City Standards
2. Firm pumping capacity defined as the total capacity of all the pumps minus the capacity of the largest pump.

The existing 30-inch SDFM was originally sized for 40 cfs and has sufficient capacity to handle the new firm pumping capacity requirement of 7.56 cfs. Additionally, because the original pump station was designed for a much higher flow rate, the Mossdale M1 SDPS has the capacity to provide the minimum and scouring velocity requirements requested in the 2022 City Standards.

Table 5-3: Existing M1 30-inch SDFM Capacity Analysis

2022 City Standards Category	2022 City Standards Requirement	Meets 2022 City Standards?	Notes
Minimum SDFM Velocity *Appendix H*	Minimum SDFM velocity during operation shall be 2 fps with the connecting pumps capable of providing 3.5 fps to help re-suspend and clean the SDFM	Yes	
Maximum SDFM Velocity *Appendix H*	Maximum SDFM velocity shall be limited to 10 fps	Yes	

5.4 Existing Mossdale M1 SDPS Mechanically Cleaned Bar Screen

All storm drain pump stations are required to be equipped with a trash screening device with a rated flow capacity greater than or equal to the firm pumping capacity of the pump station. At a minimum, the velocity through the screen shall not exceed 1 fps under any operating condition unless otherwise noted by the screen manufacturer.

Shop drawing submittals of the existing Enviro-care screen indicate the screen itself was designed for a peak flow rate of 40 cfs meeting the maximum pumping capacity of the pump station. Additionally, PACE verified the clean opening in the channel to ensure the velocity through the screen does not exceed 1 fps (approximately 0.74 fps under peak flow conditions).

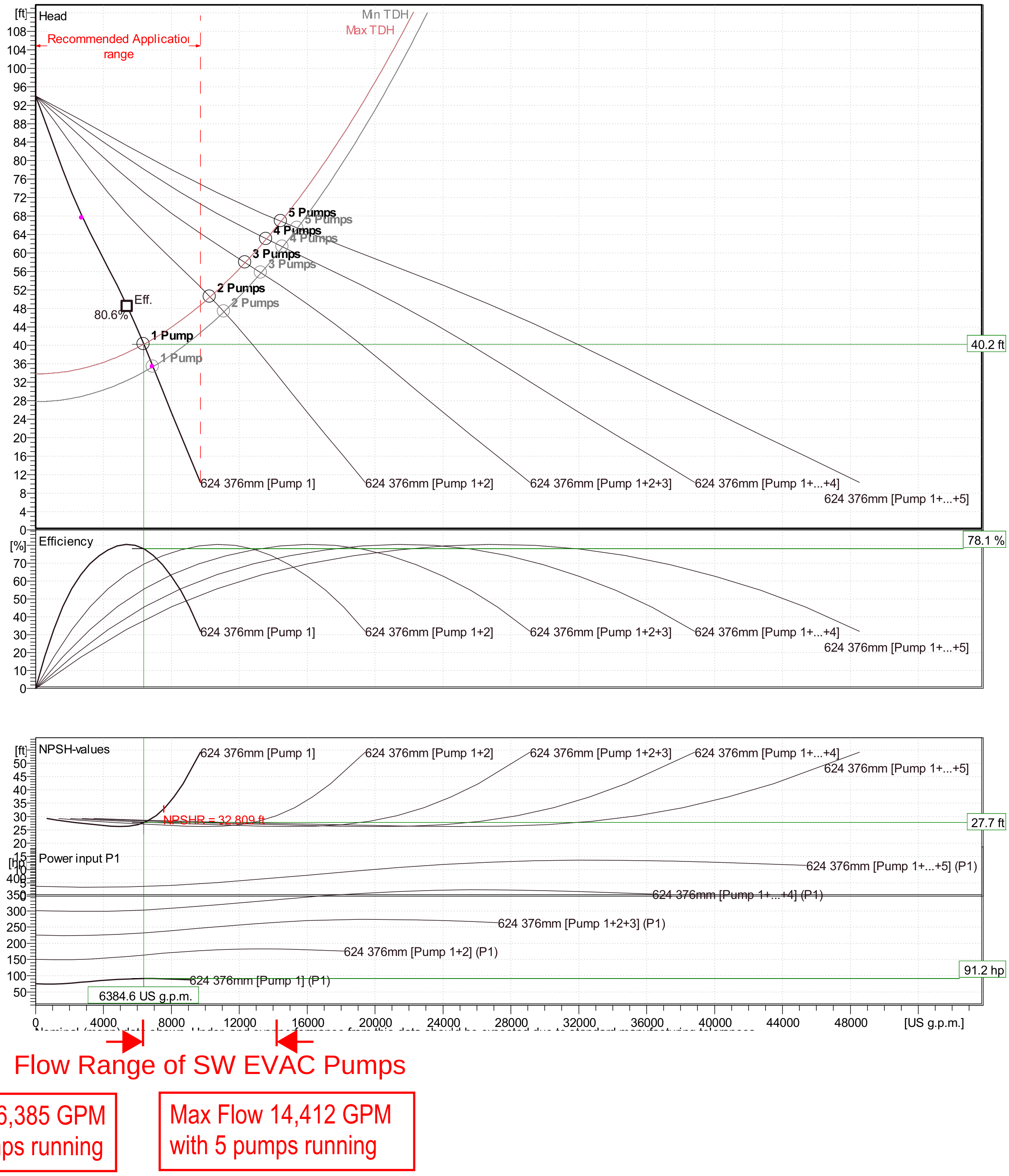
NP 3301 LT 3~ 624

Performance curve

Duty point

Flow	Head
1280 US g.p.m.	40.2 ft

Curves according to: Water, pure Water, pure [100%],39.2 °F,62.43 lb/ft³,1.6888E-5 ft²/s



6 Recommendation and Next Steps

6.1 Minimum Recommended Improvements

As analyzed in **Section 4.1**, the existing M1 SD infrastructure servicing only the M1 watershed is not capable of meeting all of the specified requirements listed in the 2022 City Standards. With the addition of the Mossdale West Development, the maximum allowable HGL was modeled to exceed the street ROW along the following streets during a 100-year, 24-hour storm event:

- 18-inch SD along Historic Ave
- 18-inch, 24-inch, 30-inch SD along Independence Ave
- 48-inch SD along Marsh Road
- 48-inch SD along Sheltered Cove West (SD feeding M1 SDPS).

To reduce the HGL to be within the street ROW, the following improvements are recommended to be evaluated by the project design team as shown in **Figure 15**. This figure shows the performance of the improvements meeting the specified 2022 City Standard requirements.

- Upsize the existing 18-inch and 24-inch SD within Historic and Independence Ave to be 30-inches in diameter (approximately 1,212 linear feet).
- Upsize the existing 30-inch SD within Ferry Launch Ave to 36-inches in diameter (approximately 445 linear feet).
- Upsize the existing 48-inch SD within Marsh Road and Sheltered Cove West to be 54-inches (approximately 325 linear feet).
- Increase the SW detention storage (see **Section 6.2**).

As stated in Section 3, due to the lack of grading and SD improvement plans for the Mossdale West Development, PACE had to make several assumptions in order to determine the feasibility of utilizing the existing M1 watershed SD Infrastructure. To verify the proposed improvements, meet the City's requirements, it is recommended PACE's SW models be updated and re-evaluated once the draft grading and SD improvements plans are ready to ensure additional improvements are not required. Specifically the location and size of the additional SW detention volumes.

6.2 Expanding M1 SW Detention Capacity

The 2022 City Standards require the onsite SW detention capacity to be greater than or equal to the 100-year, 24-hour storm volume of 60 acre-feet. The existing M1 SW detention system has an approximate storage capacity of 6.3 acre-feet. **Therefore, the Development is required to provide an additional 53.7 acre-feet of storage in order to meet the 2022 City Standards.**

Table 6-1: M1 SW Detention Capacity

Parameter	Value
M1 + Mossdale West Watershed 100-year, 24-hour Storm Volume	60.00 acre-ft
Existing M1 SW Detention System Capacity	6.3 acre-ft
Additional SW Detention Storage Requirement[1]	**-53.7 acre-ft**

Notes
1. Additional SW detention storage to be added within Park West at Mossdale Landing and within the Mossdale West Development. PACE to update model with the proposed detention location to verify the storage is adequate to prevent flooding beyond the street ROW.

6.2.1 *Potential SW Detention Locations*

SW detention is most effective as close as possible to the M1 SDPS as storage in close proximity to the pump station will better attenuate peak flows exceeding the capacity of the pump station while reducing the overall HGL within the collection system. **Considering the existing footprint of the 6.3 acre-feet of storage within Park West, it may not be feasible to add all of the deficient storage volume within the existing Park West.** Additionally, the proposed Mossdale West Park may not be large enough to provide the remaining underground storage for the entire 100-year, 24-hour storm volume.

Therefore, because the existing Mossdale M1 SDPS is oversized, PACE is recommending the Development team discuss with the City alternatives to providing all of the 100-year, 24-hour storm volume. For example, PACE was able to successfully model the improvements by adding a minimum 5.1 acre-feet at Park West with the addition of the oversized Mossdale M1 SDPS (see **Figure 15**). While as much storage will be provided within the Mossdale West Development as an additional factor of safety, because the existing Mossdale M1 SDPS is oversized, it is recommended to first discuss the modeling results with the City before installing additional unused infrastructure.

<LINK>W:\C336(GIS)\Projects\C336_Mossdale\C336_Mossdale.aprx</LINK> - Existing M1 & Proposed M4 100YR 24HR Flow Rates

MOSSDALE WEST

EXISTING MOSSDALE M1 AND PROPOSED M4 WATERSHEDS 100-YEAR, 24-HOUR RECOMMENDED MINIMUM FIXES

PACE Advanced Water Engineering

Date: 10/18/2024

Job Number: C336

Figure 15

Attachment A – Mossdale West Vesting Tentative Map Tract No. 4146 – June 2024

MOSSDALE LANDING WEST

VESTING TENTATIVE MAP

TRACT NO. 4146

VICINITY MAP

N.T.S.

GENERAL NOTES:

1) OWNER/APPLICANT: WSBG INVESTMENTS, LP
SURJIT CHAHAL
2217 COFFEE ROAD,
MODESTO, CA 95355
CONTACT: SURJIT CHAHAL
(209) 485-4089

2) CIVIL ENGINEER: O'DELL ENGINEERING
1165 SCENIC DRIVE, SUITE A
MODESTO, CA 95350
CONTACT: MIKE PERSAK
(209) 571-1765

3) ASSESSOR'S PARCEL NUMBERS: 191-190-010, 191-190-072, 191-610-020, 191-610-022, 191-620-590, 191-340-030.

4) SUBJECT PROPERTY SHOWN TO BE IN ZONE "X" ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAP 06077C0615F (AREAS PROTECTED BY LEEVES FROM THE 1% ANNUAL CHANCE FLOOD).

5) TOTAL AREA: 205.9± ACRES
TOTAL NUMBER OF LOTS: 829 SINGLE FAMILY RESIDENTIAL
14 OPEN SPACE/PARKS LOTS

6) POTABLE WATER, RECYCLED WATER, SANITARY SEWER AND STORM DRAIN SYSTEMS TO BE INSTALLED IN CONFORMANCE WITH CITY OF LATHROP STANDARDS AND MASTER UTILITY PLANS OR AS OTHERWISE APPROVED BY PUBLIC WORKS DIRECTOR.

   * WATER SUPPLY CITY OF LATHROP (GROUNDWATER AND SURFACE WATER)

   * SEWER TREATMENT AND DISPOSAL CITY OF LATHROP.

   * LOT 538 IS RESERVED AS A POTENTIAL SANITARY SEWER PUMP STATION LOCATION.

   * STORMWATER CITY OF LATHROP – DISCHARGE TO SAN JOAQUIN RIVER. IF ULTIMATE OUTFALL IS NOT IN PLACE AT TIME OF CONSTRUCTION STORM DRAINAGE TO BE TEMPORARILY RETAINED.

7) GAS & ELECTRIC SERVICE TO BE PROVIDED BY PACIFIC GAS & ELECTRIC. INSTALLATION SHALL BE IN CONFORMANCE WITH CITY STANDARDS AND CENTRAL LATHROP SPECIFIC PLAN. EXISTING SERVICES SHALL BE PLACED UNDERGROUND IN CONFORMANCE WITH THE SUBDIVISION ORDINANCE.

8) TELEPHONE SERVICE TO BE PROVIDED BY AT&T. EXISTING SERVICES SHALL BE PLACED UNDERGROUND IN CONFORMANCE WITH THE SUBDIVISION ORDINANCE.

9) STREET CROSS SECTIONS AND MINIMUM CENTERLINE RADII ARE IN CONFORMANCE WITH WEST LATHROP SPECIFIC PLAN. ROAD IMPROVEMENTS TO BE INSTALLED PER CITY OF LATHROP STANDARDS AND WEST LATHROP SPECIFIC PLAN. WHEN STANDARDS DIFFER THE SPECIFIC PLAN SHALL PREVAIL. ROADS TO BE PUBLICLY OWNED AND MAINTAINED UNLESS NOTED OTHERWISE.

10) EXISTING ZONING: RL-MV, CV-MV, P-MV, REC-RES-MV.

11) EXISTING USE: VACANT

12) PROPOSED USE: P-MV, RL-MV

13) EXISTING GROUND ELEVATIONS SHOWN OR NOTED ARE BASED ON THE TOPOGRAPHY SURVEY PERFORMED ON FEBRUARY 16, 2022.

14) UNLESS OTHERWISE SPECIFICALLY STATED IN THE CONDITION OF APPROVAL, LOCAL AGENCY APPROVAL OF THIS MAP SHALL CONSTITUTE AN EXPRESSED FINDING THAT THE PROPOSED DIVISION AND DEVELOPMENT OF THE PROPERTY WILL NOT UNREASONABLY INTERFERE WITH THE FREE AND COMPLETE EXERCISE OF RIGHTS DESCRIBED IN GOVERNMENT CODE SECTION 66436(a)(3)(A)(i).

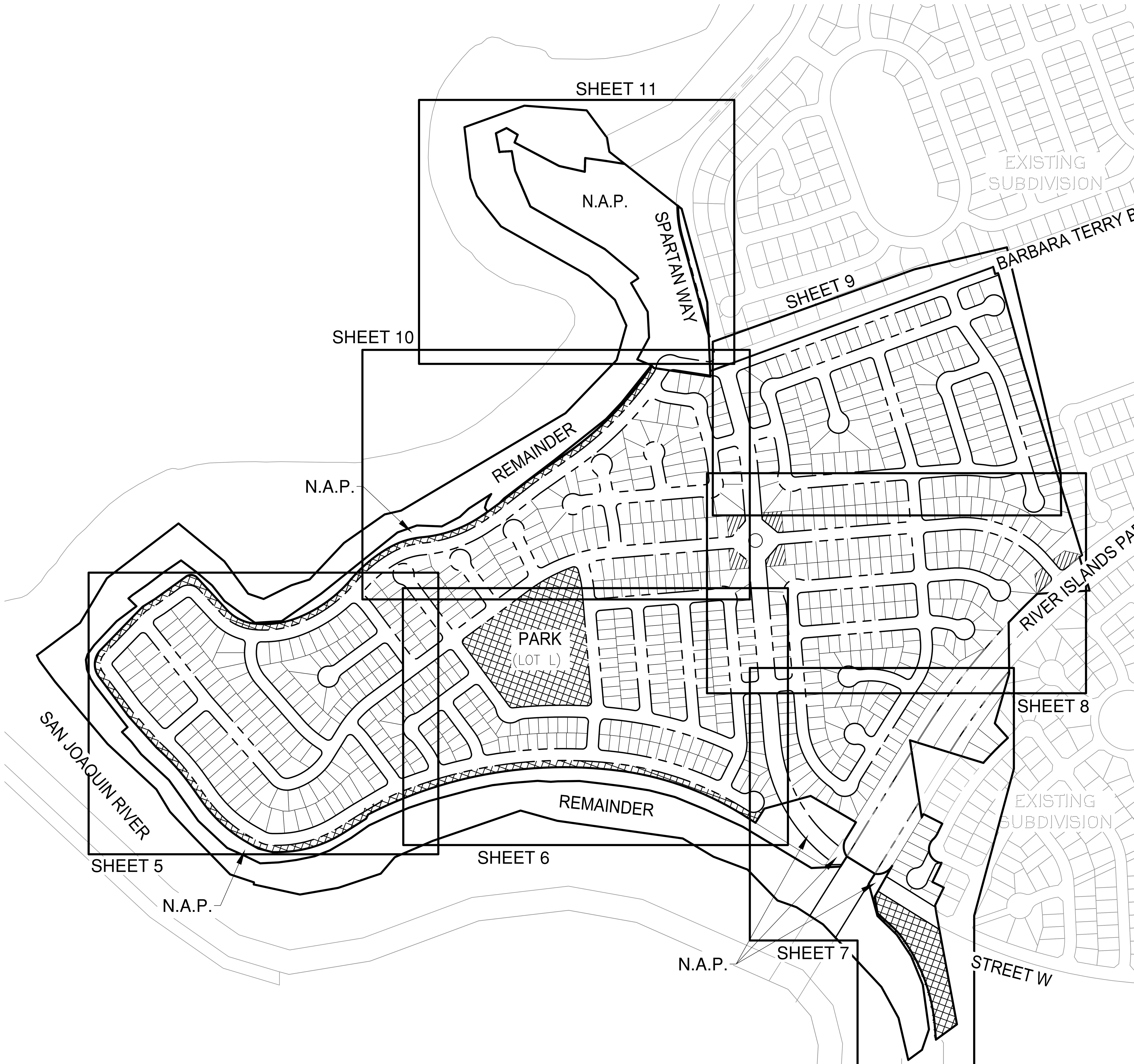
15) UTILITY LOCATIONS AND LOT DIMENSIONS ARE PRELIMINARY AND SUBJECT TO FINAL ENGINEERING DESIGN.

16) THE PROJECT MAY BE PHASED. MULTIPLE FINAL MAPS MAY BE FILED ON THE LANDS SHOWN ON THIS VESTING TENTATIVE MAP IN ACCORDANCE WITH ARTICLE 4, SECTION 66.456.1 OF THE SUBDIVISION MAP ACT.

17) SANITARY SEWER PIPES ARE 8" MINIMUM, POTABLE WATER PIPES ARE 8" MINIMUM, RECYCLED WATER PIPES ARE 6" MINIMUM, STORM DRAIN PIPES ARE 15"MIN.

18) THE APPLICANT RESERVES THE RIGHT TO PHASE PROJECT PER THE SUBDIVISION MAP ACT.

19) THE BOUNDARY AS SHOWN IS COMPILED FROM RECORD INFORMATION.



N

0 150 300 600

SCALE: 1" = 300'

SHEET INDEX

1	COVER SHEET
2	EXISTING CONDITIONS
3	EXISTING CONDITIONS
4	STREET CROSS SECTIONS
5	LAYOUT
6	LAYOUT
7	LAYOUT
8	LAYOUT
9	LAYOUT
10	LAYOUT
11	LAYOUT
12	PHASING PLAN

LEGEND

	PROJECT BOUNDARY
	RIGHT-OF-WAY
	PROPERTY LINE
	CENTERLINE
	10' P.U.E.
W	WATER LINE
RW	RECLAIMED WATER LINE
SS	SANITARY SEWER LINE
SD	STORM DRAIN LINE
W	EXISTING WATER LINE
IRR	EXISTING IRRIGATION LINE
RW	EXISTING RECLAIMED WATER LINE
SS	EXISTING SANITARY SEWER LINE
SD	EXISTING STORM DRAIN LINE
	EXISTING FIRE HYDRANT
	EXISTING WATER VALVE
	EXISTING SANITARY SEWER MANHOLE
	EXISTING STORM DRAIN MANHOLE
	EXISTING STORM DRAIN INLET
	EXISTING STORM DRAIN CATCH BASIN
N.A.P.	NOT A PART OF THIS SUBDIVISION
	LANDSCAPED ENTRY
	PARK

811

Know what's below.
Call before you dig.

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

MOSSDALE LANDING WEST

VESTING TENTATIVE MAP

LATHROP, CALIFORNIA

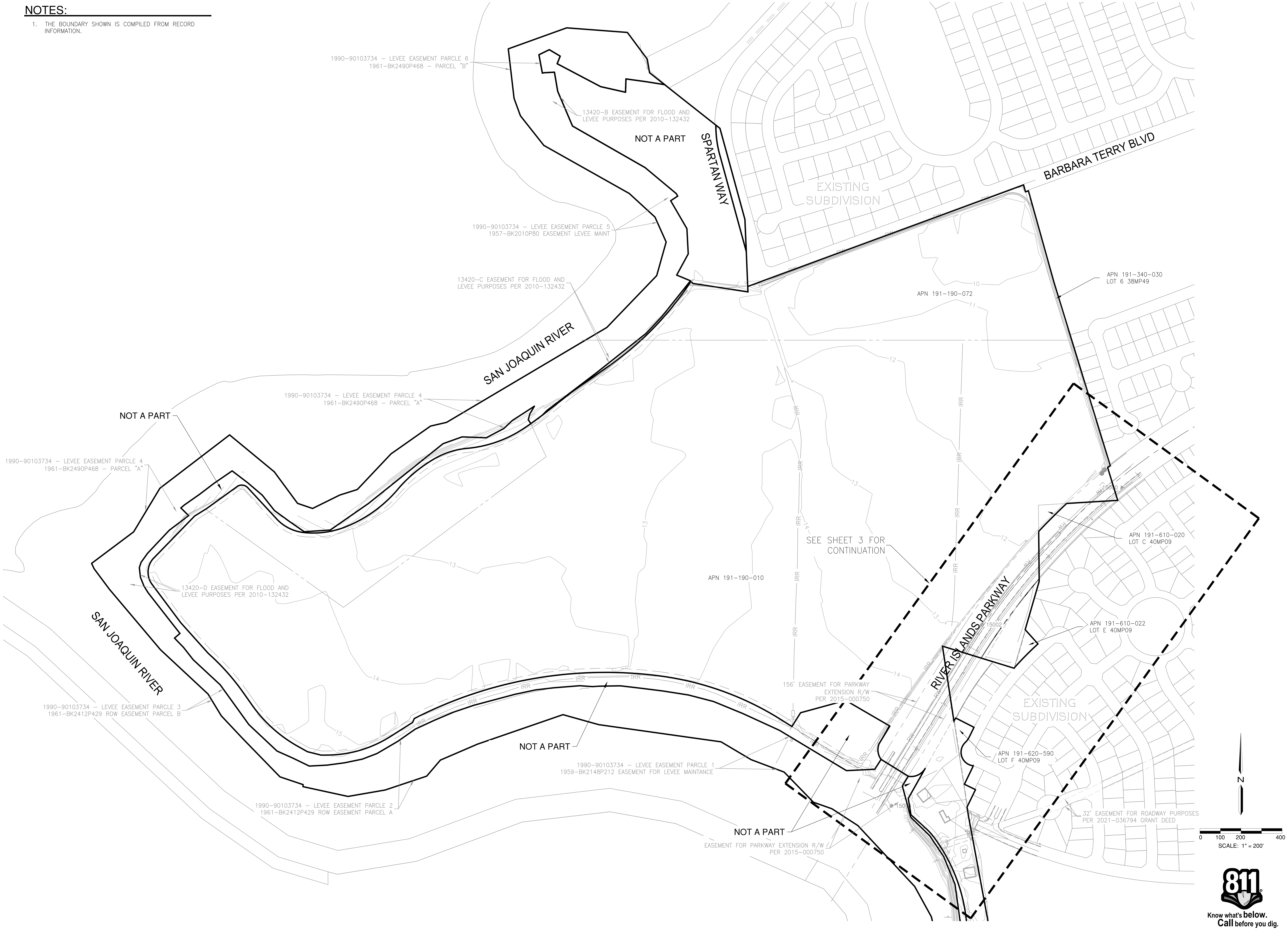
COVER SHEET

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

NOTES:

1. THE BOUNDARY SHOWN IS COMPILED FROM RECORD INFORMATION.



H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg EAHomed 10:55:21 06/21/2024

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

EXISTING CONDITIONS

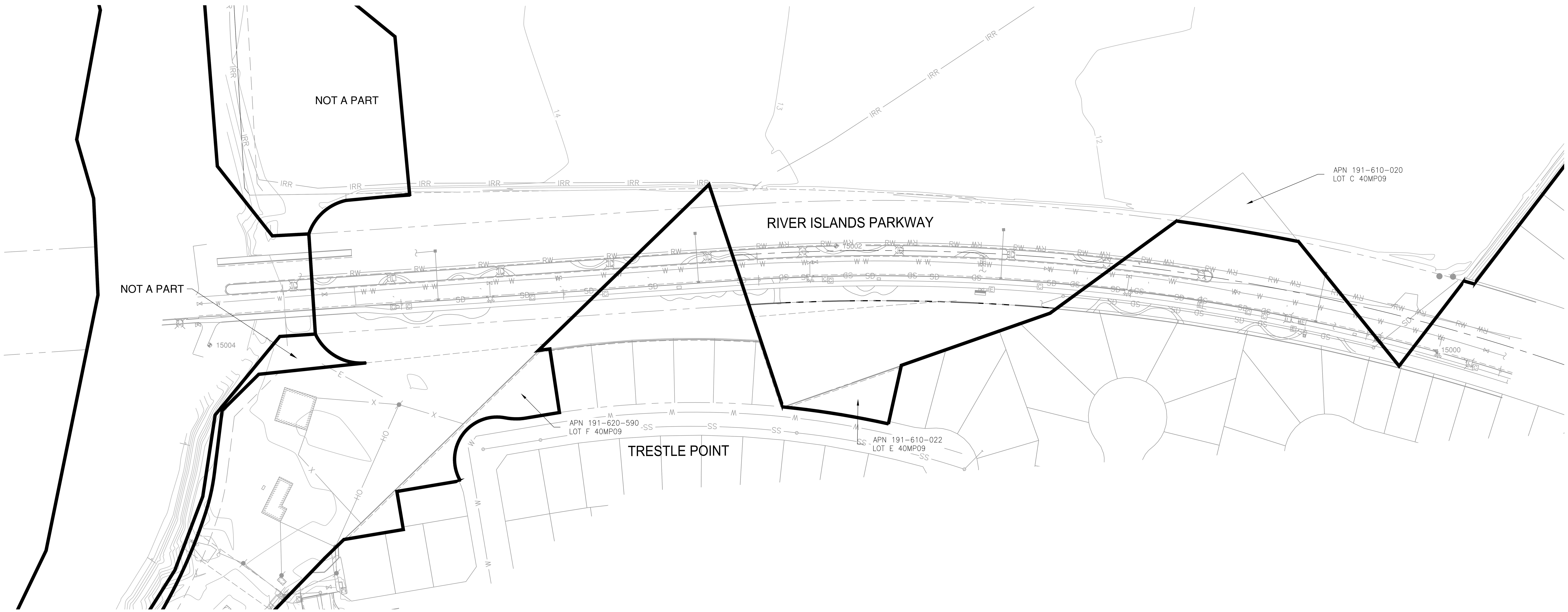
APPROVED:

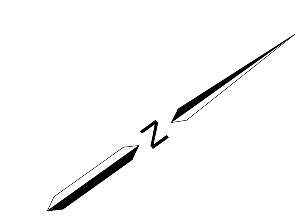
DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
2
OF
12

NOTES:

1. THE BOUNDARY SHOWN IS COMPILED FROM RECORD INFORMATION.





0 40 80 160
SCALE: 1" = 80'

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

EXISTING CONDITIONS

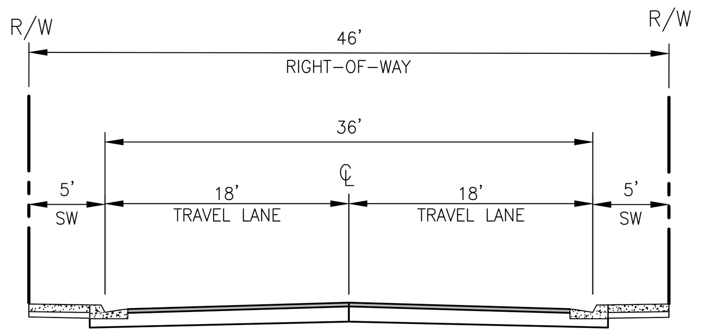
APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
3
OF
12

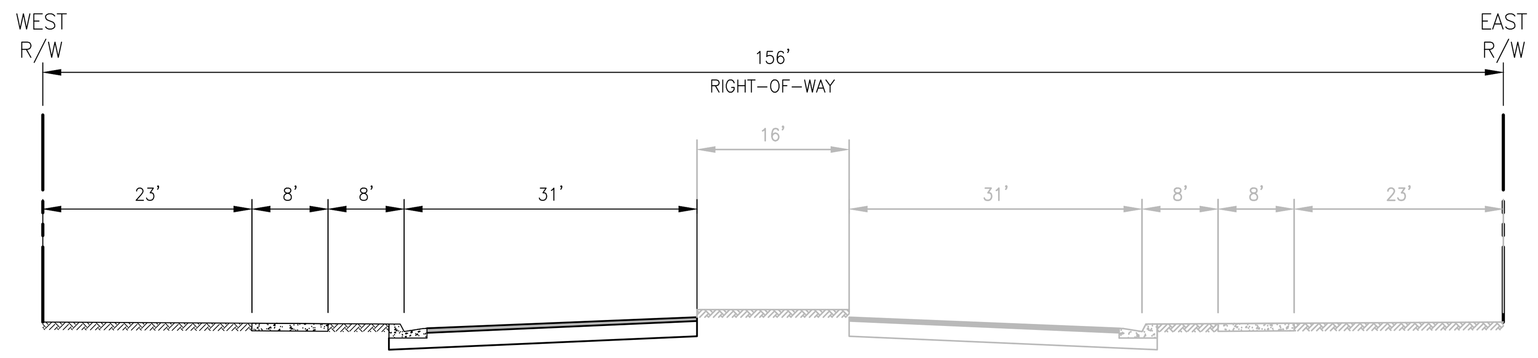
811 Know what's below. Call before you dig.

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg EAHamed 10:55:21 06/21/2024



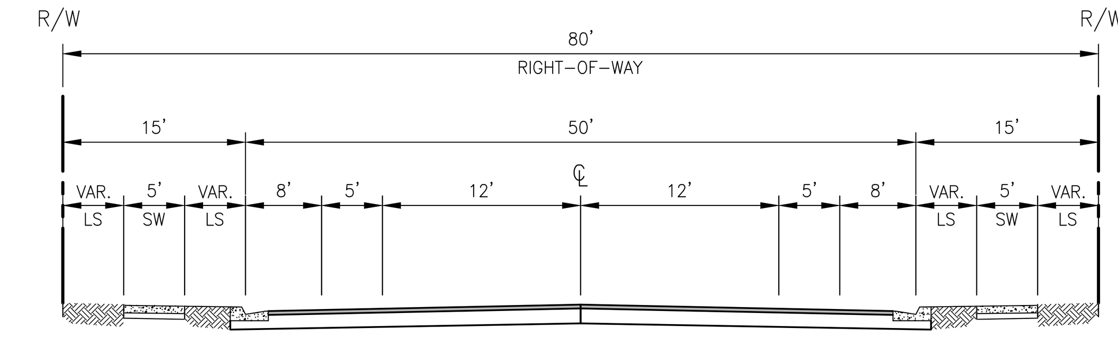
1 INTERIOR STREETS CROSS SECTION

NOT TO SCALE



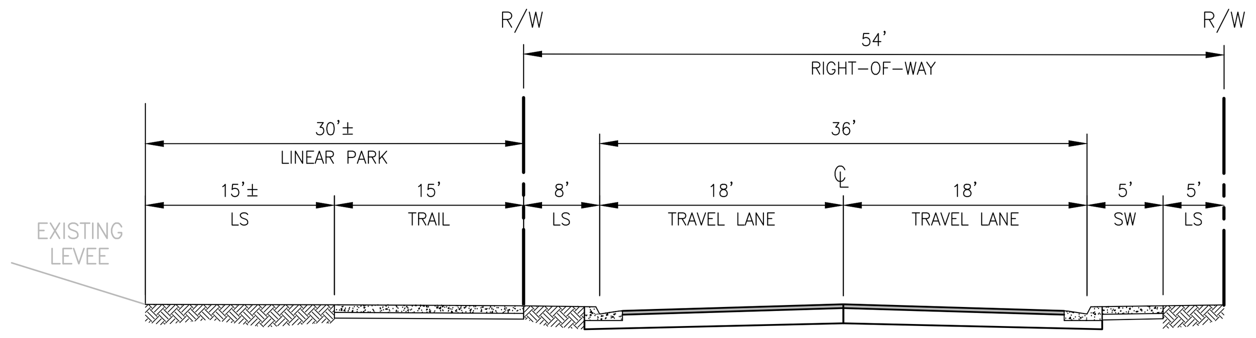
2 RIVER ISLANDS PARKWAY CROSS SECTION

NOT TO SCALE



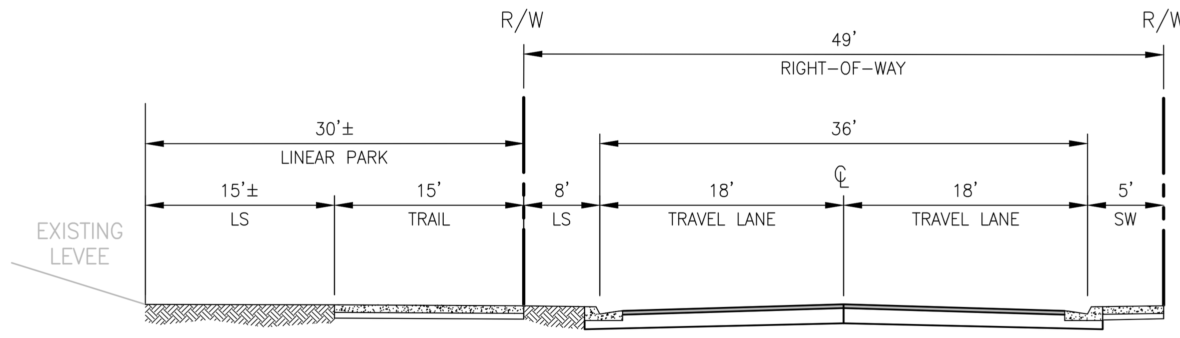
3 TOWNE CENTRE DRIVE CROSS SECTION

NOT TO SCALE



4 STREET A CROSS SECTION (54' ROW)

NOT TO SCALE



5 STREET A CROSS SECTION (49' ROW)

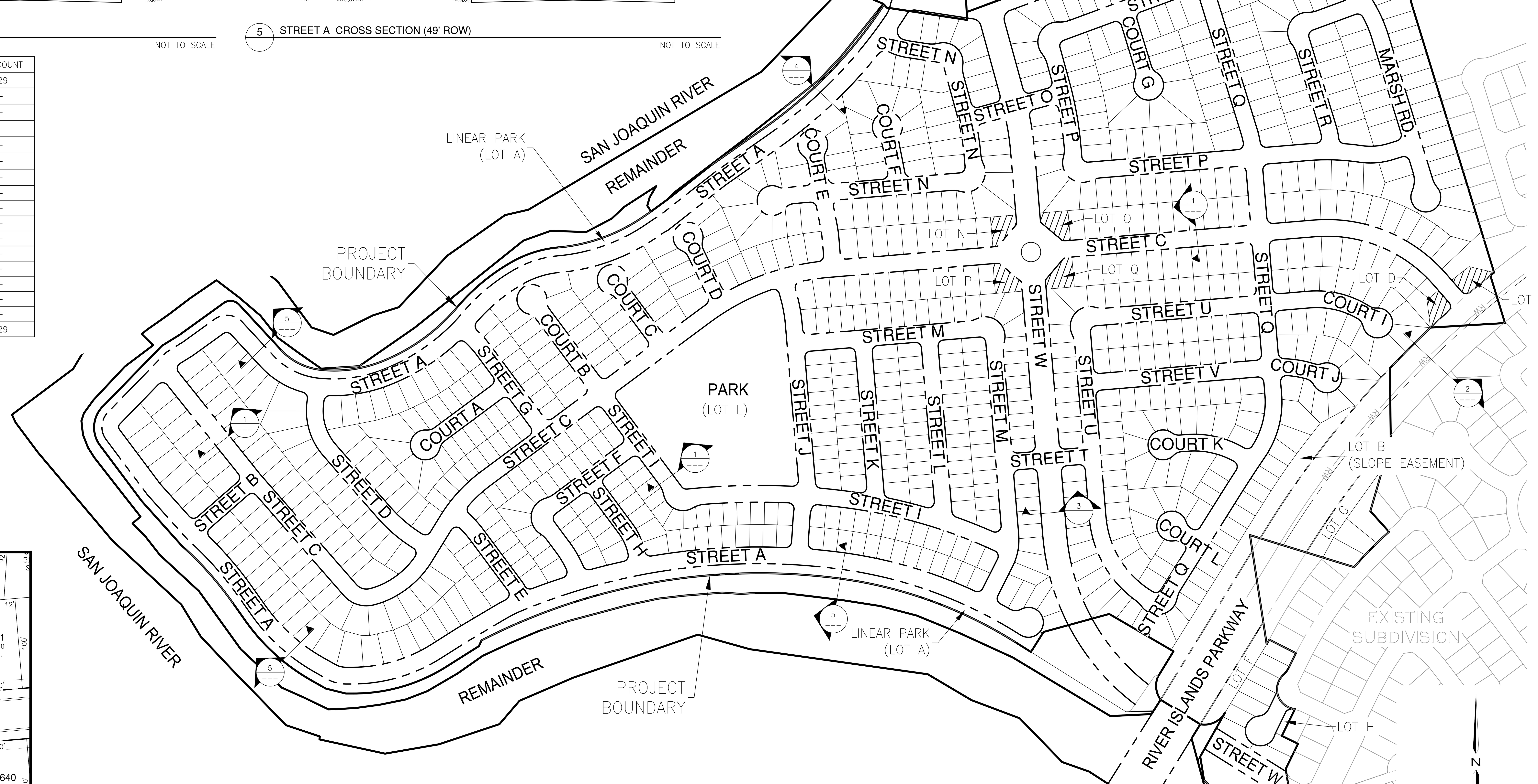
NOT TO SCALE

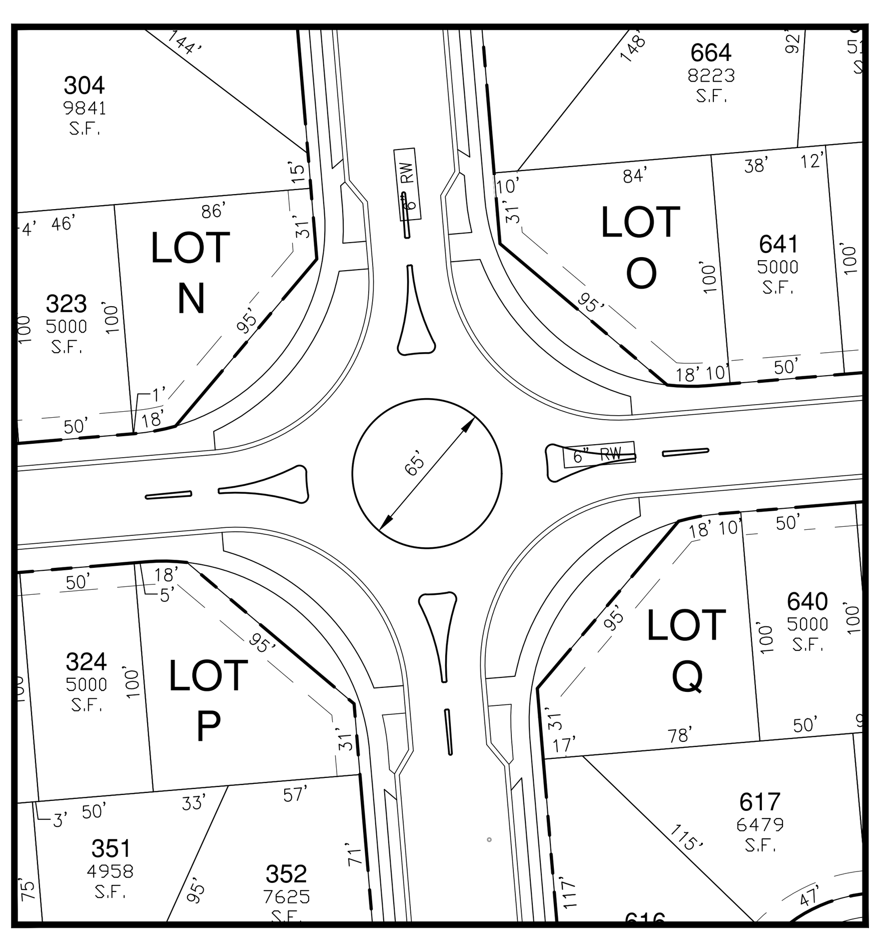
PARCEL/USE	ACREAGES	LOT COUNT
RESIDENTIAL	146.7±	829
RIVER ISLANDS PARKWAY	4.4±	–
LINEAR PARK (LOT A) *	4.8±	–
NEIGHBORHOOD PARK (LOT L) *	6.2±	–
SLOPE EASEMENT (LOT B) *	1.4±	–
LOT C (PARK) *	2.0±	–
LANDSCAPED ENTRIES (LOT D & E)	0.3±	–
LOT F *	0.4±	–
LOT G *	0.6±	–
LOT H *	0.1±	–
LOT M *	0.4±	–
LOT N *	0.1±	–
LOT O *	0.1±	–
LOT P *	0.1±	–
LOT Q *	0.1±	–
REMAINDER	38.2±	–
TOTAL	205.9±	829

* LOT DEDICATED TO THE CITY

LEGEND

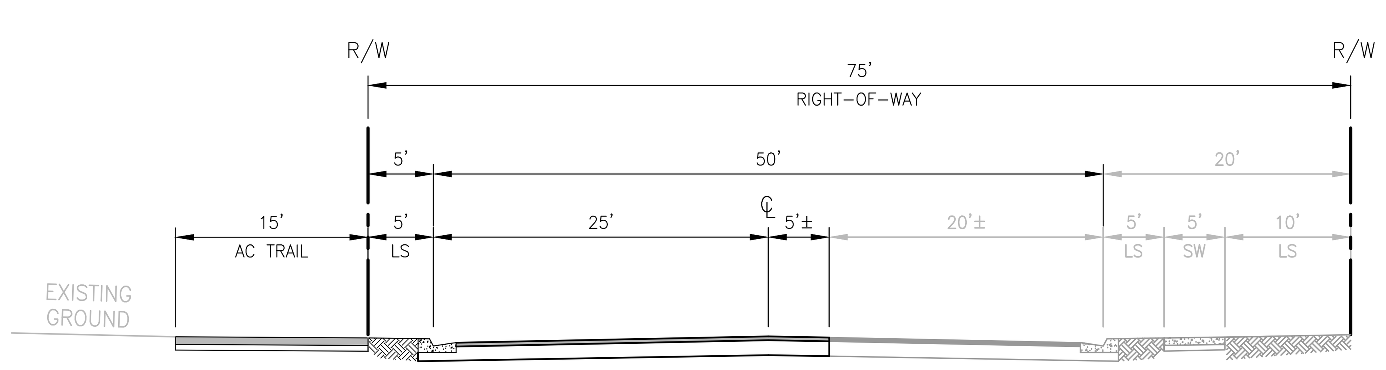
LANDSCAPED ENTRY





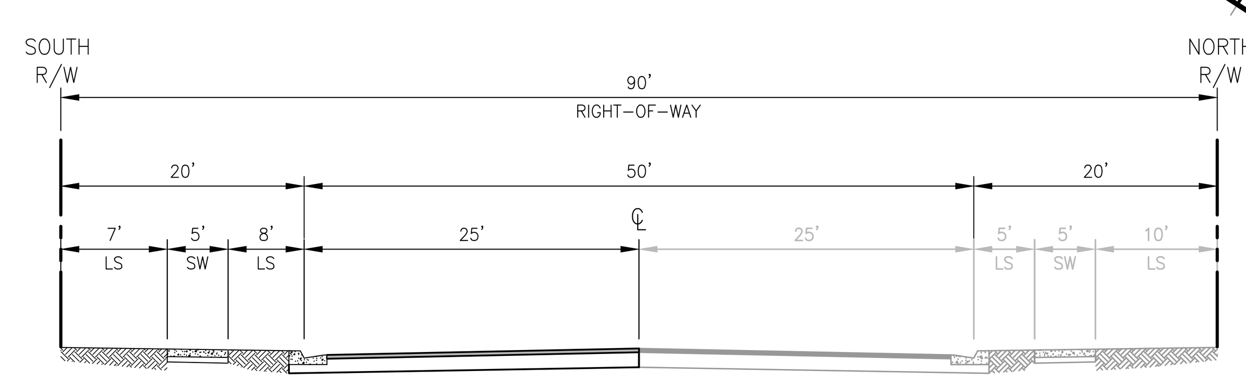
ROUNDABOUT DETAIL

NOT TO SCALE



6 SPARTAN WAY CROSS SECTION

NOT TO SCALE



7 BARBARA TERRY BOULEVARD CROSS SECTION

NOT TO SCALE

Know what's below. Call before you dig.

PLAN REVISIONS		
NO.	DATE	REVISION

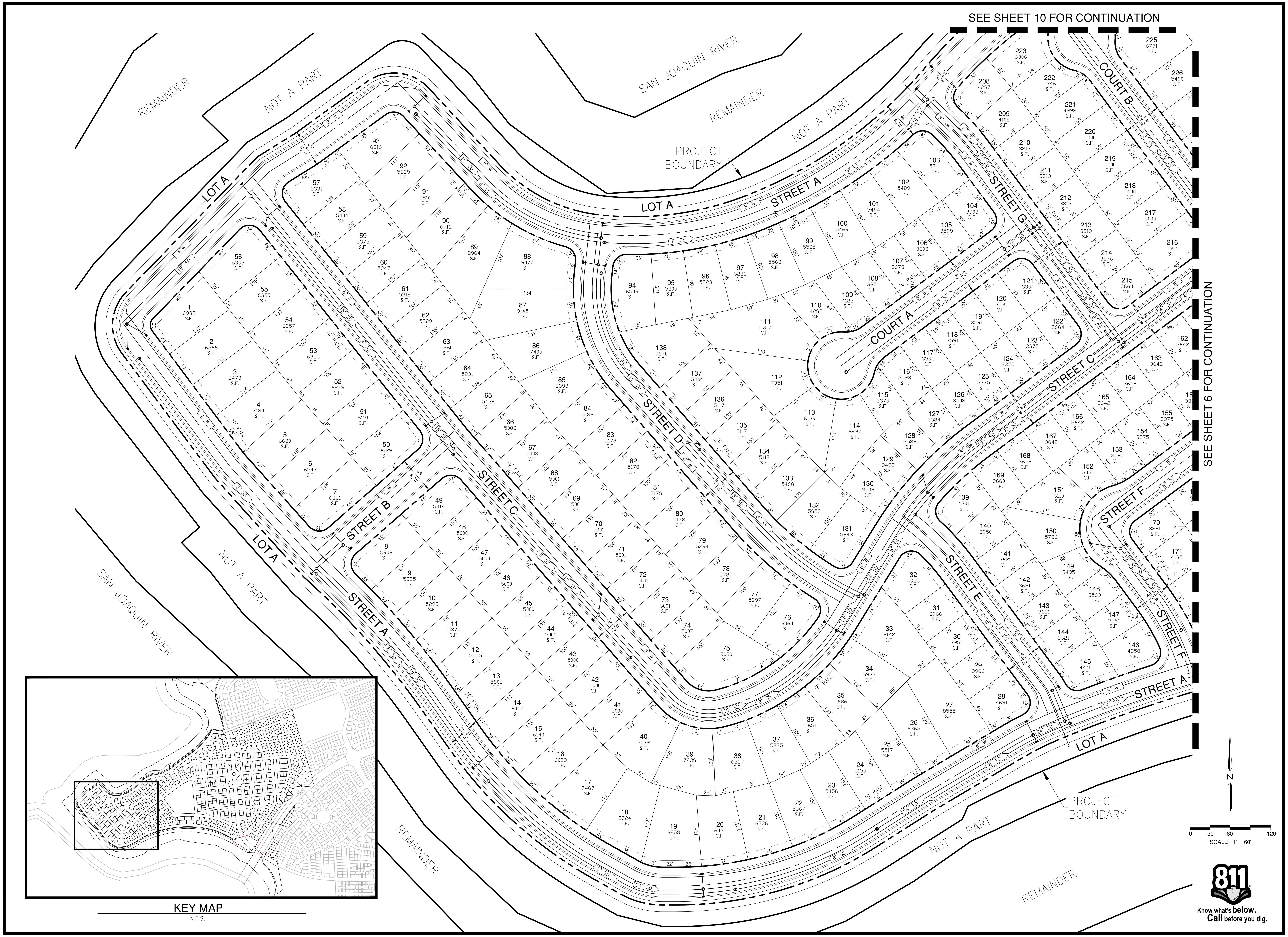
O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

STREET CROSS SECTIONS

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM–MOSSDALE VESTING TENTATIVE MAP–38980.DWG



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

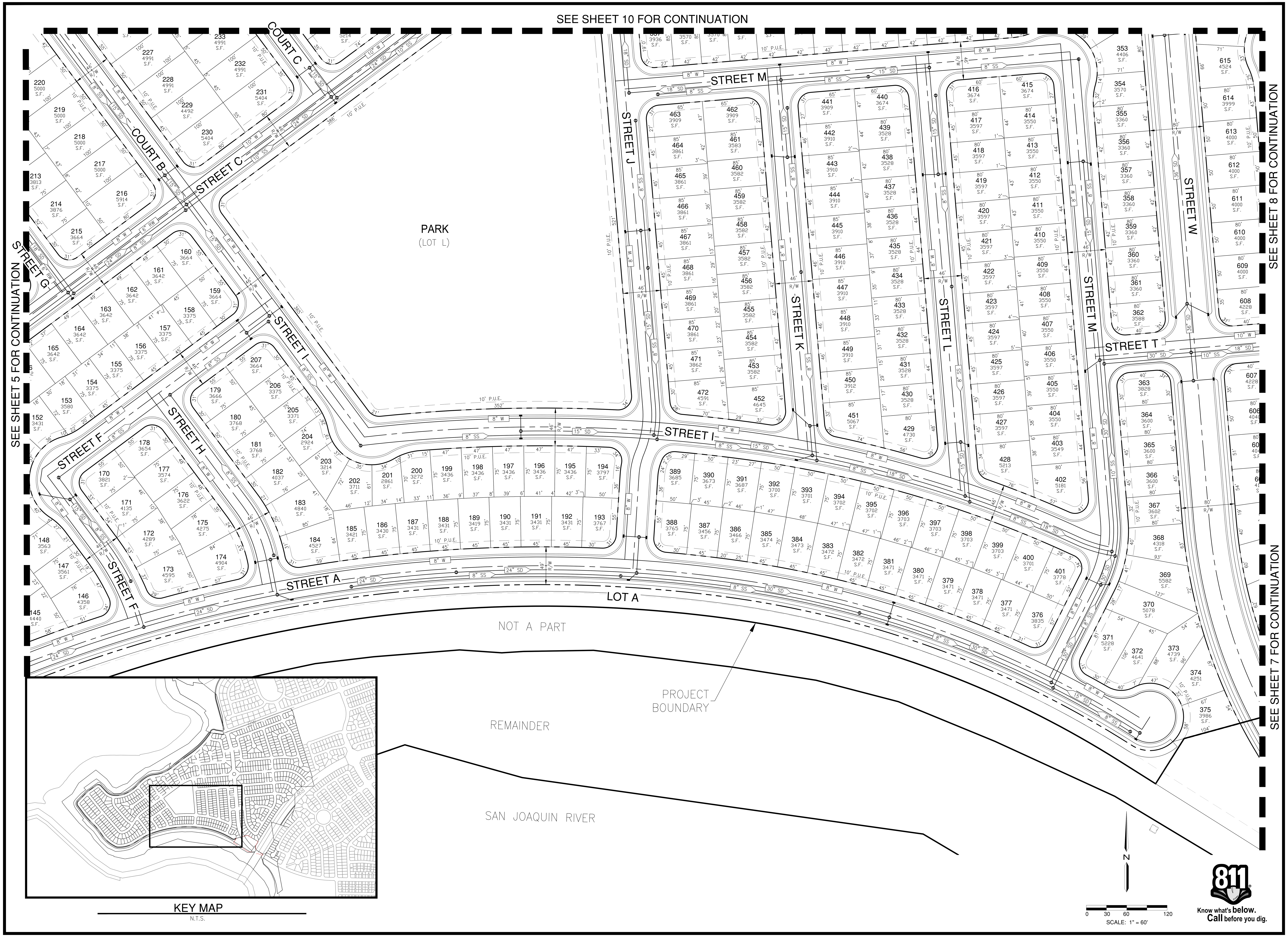
LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
5
OF
12

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg EAHamed 10:55:21 06/21/2024



H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg EAHomed 10:56:21 06/21/2024

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

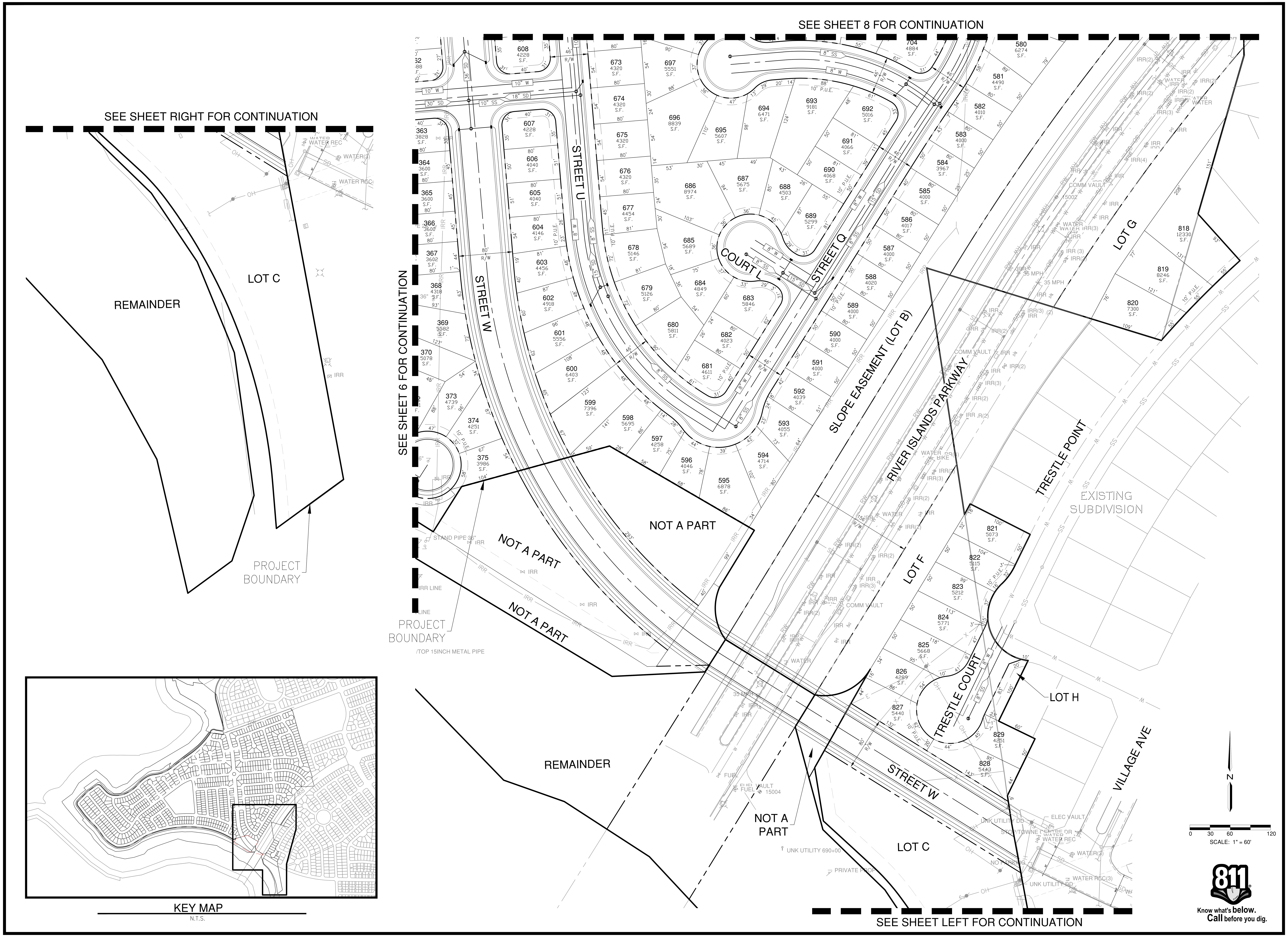
MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
6
OF
12



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

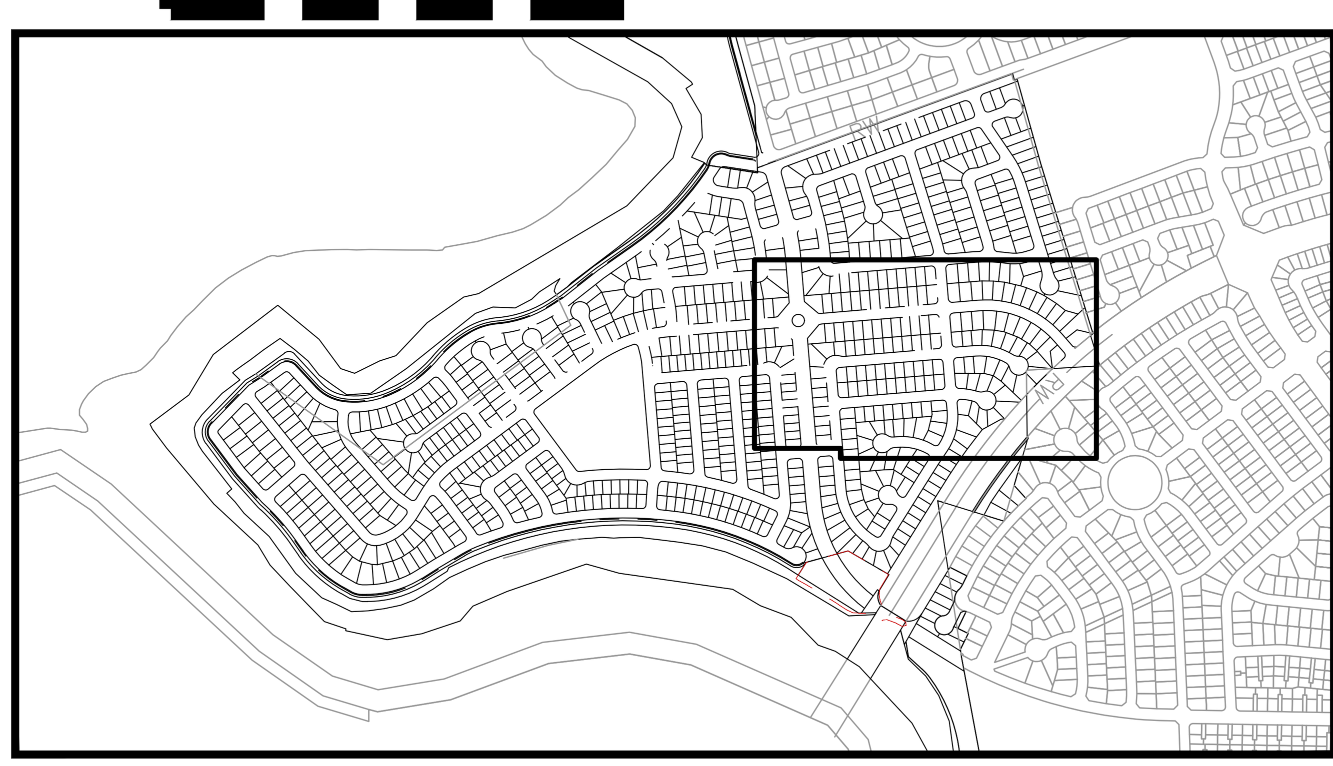
SHEET NO.
7
OF
12

SEE SHEET 9 FOR CONTINUATION

SEE SHEET 10 FOR CONTINUATION

SEE SHEET 6 FOR CONTINUATION

SEE SHEET 7 FOR CONTINUATION



KEY MAP

N.T.S.

N

0 30 60 120

SCALE: 1" = 60'

811 Know what's below. Call before you dig.

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

MOSSDALE LANDING WEST

VESTING TENTATIVE MAP

LATHROP, CALIFORNIA

LAYOUT

APPROVED:

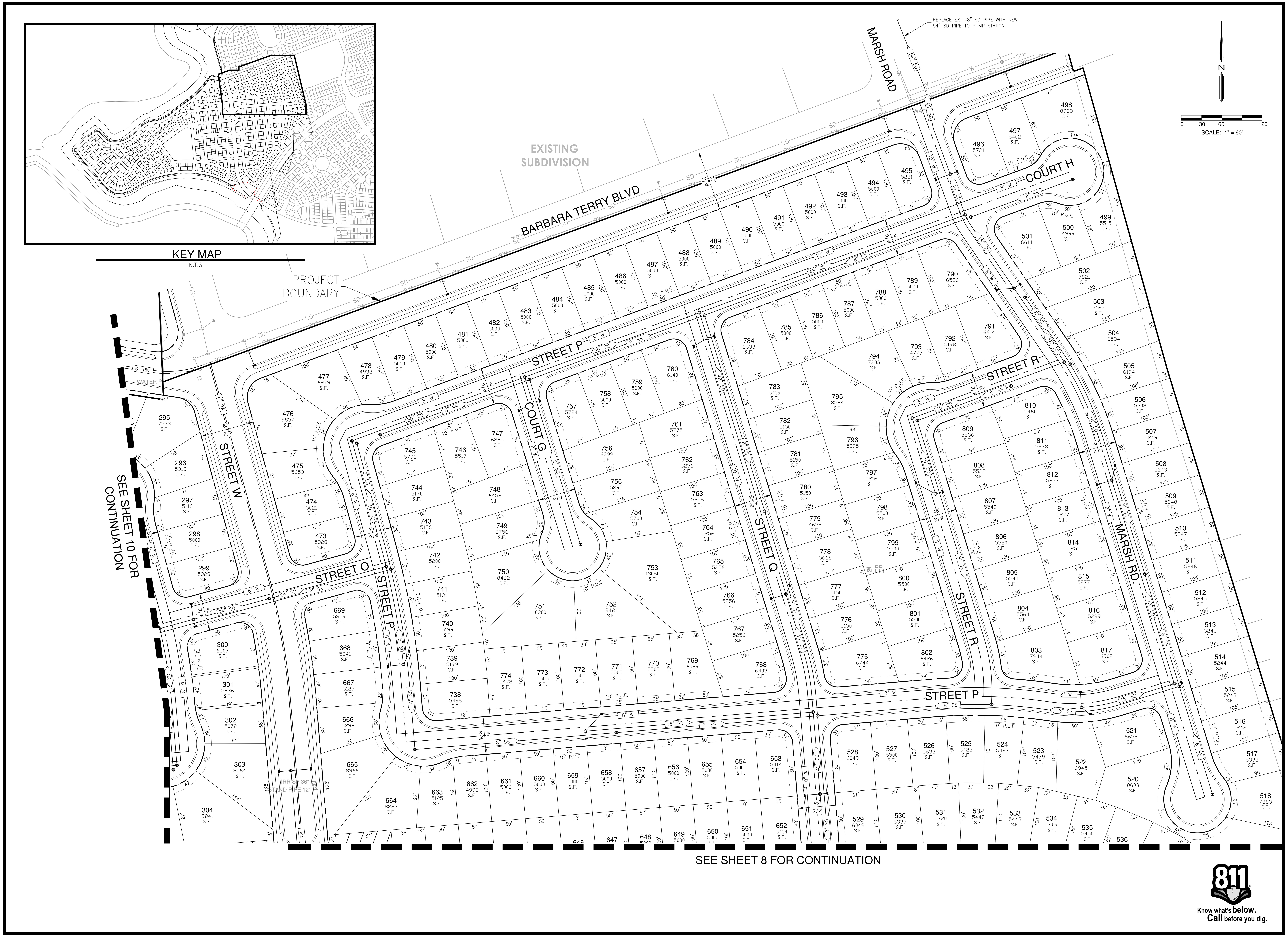
DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.

8

OF

12



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

MOSSDALE LANDING WEST

VESTING TENTATIVE MAP

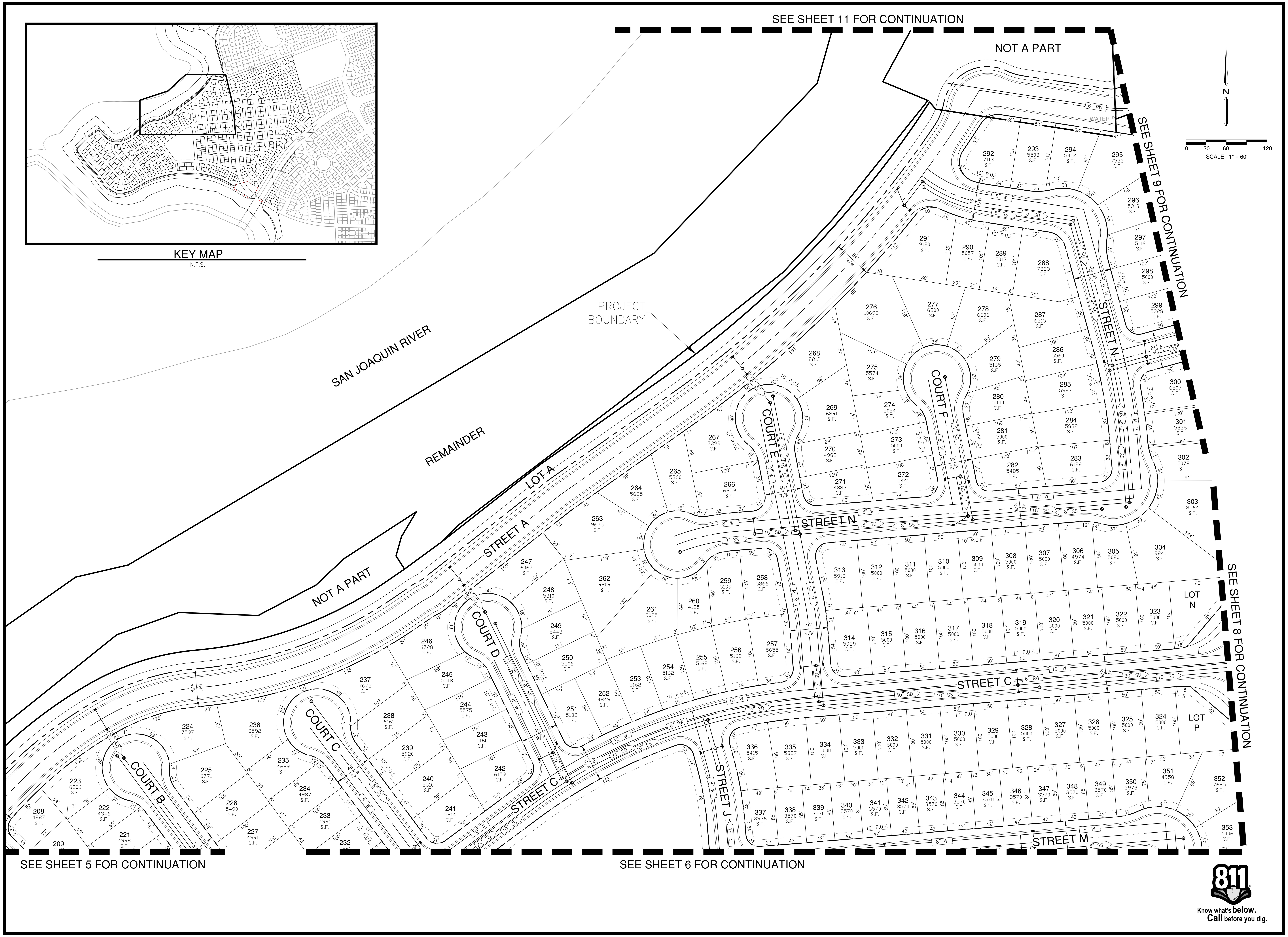
LATHROP, CALIFORNIA

LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
9
OF
12



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

MOSSDALE LANDING WEST

VESTING TENTATIVE MAP

LATHROP, CALIFORNIA

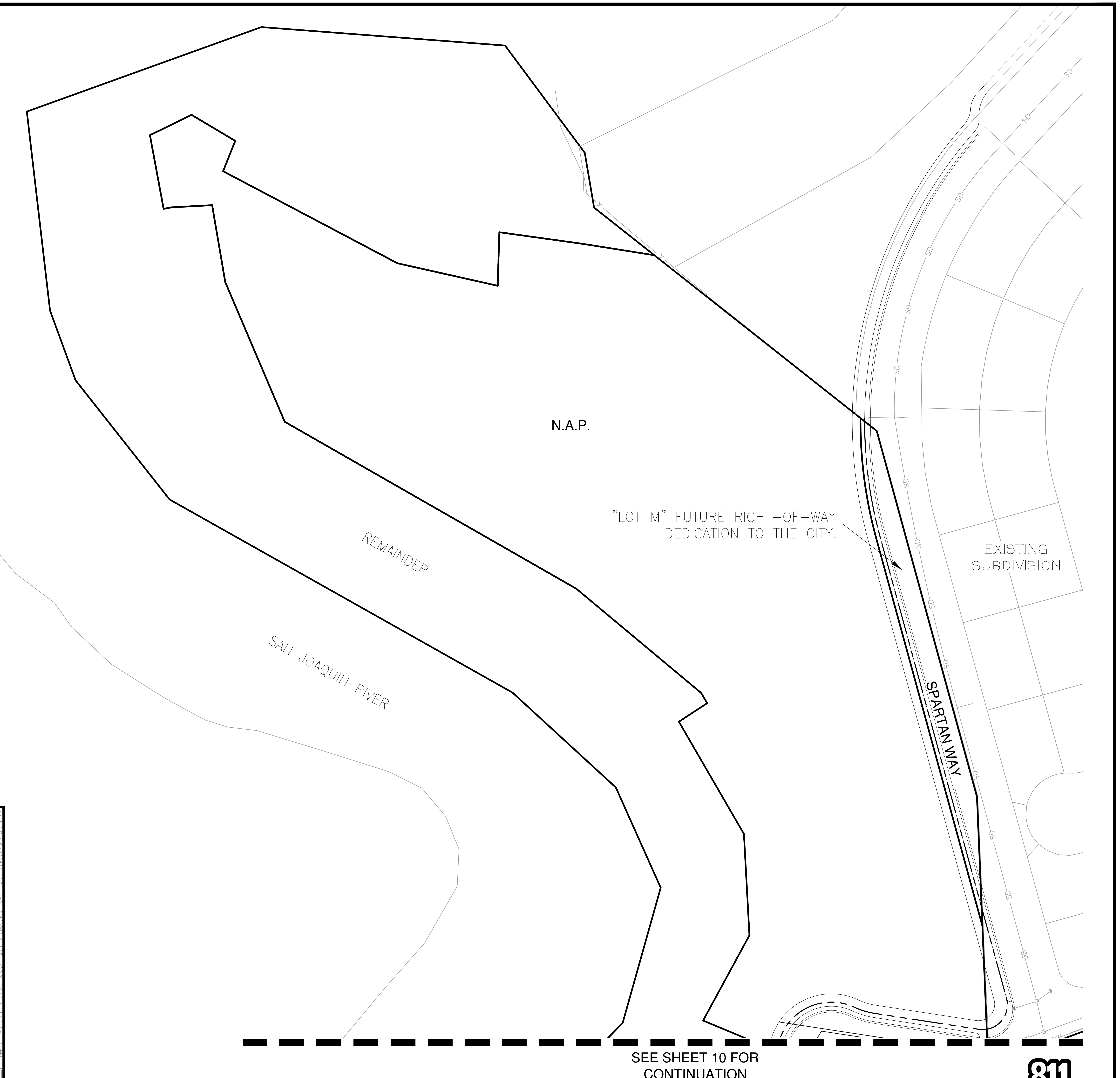
LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
10
OF
12

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg EAHamed 10:57:21 06/21/2024



SEE SHEET 10 FOR
CONTINUATION

KEY MAP
N.T.S.

Know what's **below.**
Call before you dig.

PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING
1165 Scenic Drive, Suite A
Modesto, CA 95350
odellengineering.com

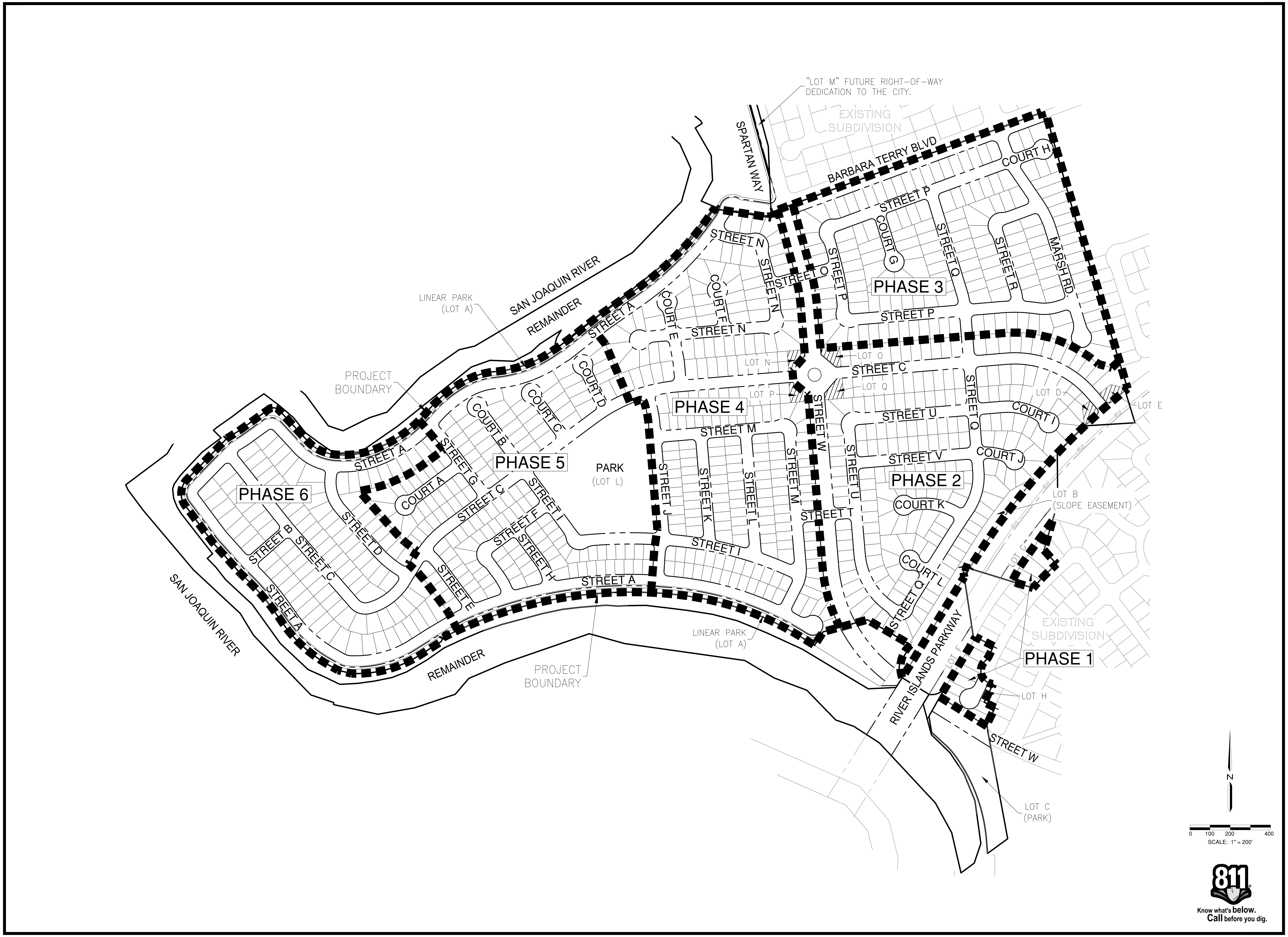
MOSSDALE LANDING WEST
VESTING TENTATIVE MAP
LATHROP, CALIFORNIA

LAYOUT

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg EAHomed 10:58:21 06/21/2024



PLAN REVISIONS

NO.	DATE	REVISION

O'DELL ENGINEERING

1165 Scenic Drive, Suite A
Modesto, CA 95350

odellengineering.com

MOSSDALE LANDING WEST

VESTING TENTATIVE MAP

LATHROP, CALIFORNIA

PHASING PLAN

APPROVED:

DESIGNED:	MP/EH
DRAWN:	EH/BC/DG
CHECKED:	MP
SCALE:	AS SHOWN
DATE:	6/21/2024
JOB NO.:	38980
FILE NO.:	VTM-MOSSDALE VESTING TENTATIVE MAP-38980.DWG

SHEET NO.
12
OF
12

H:\38980-Mossdale Landing West\Planning\PlanDwg\VTM-Mossdale Vesting Tentative Map-38980.dwg EAHamed 10:58:21 06/21/2024

Appendix B – Mossdale M1 SDPS Hydraulic Calculations

City of Lathrop
Mossdale M1 Stormwater Pump Station

Hydraulic Caculations

Tuesday, November 5, 2024

Calculation By:

Thomas Daniel Mihara, P.E.

Prepared by:

PACE
Advanced Water Engineering

Pacific Advanced Civil Engineering
17520 Newhope Street Suite #200
Fountain Valley, CA 92708

Mossdale M1 SDPS - Firm Pumping Capacity Requirements

Required Firm Pumping Capacity Requirements

Per 2022 City Standards Section 3-7.7 C

Parameter	Value	Units	Notes

C. All detention basins shall have outlet facilities providing terminal drainage capable of emptying a full basin within 96 hours.

1. Detention basins with gravity outlet structures will operate without backwater effects under the design storm.

2. A drainage pump may be designed as the basin outlet control. A backup power generator will be required to accompany any drainage pump.

Total M1+M4 100-year 24-hour Storm Volume

Design Storm for Detention Basin and Mossdale Pump Station	100-year 24-hr	
M1 100-year 24-hr Storm Volume	21.20	acre-ft
M4 100-year 24-hr Storm Volume	38.80	acre-ft
Total M1+M4 100-year 24-hr Storm Volume	**60.00**	**acre-ft**

M1 SWPS Firm Pumping Capacity Requirement

Required Drainage Time Frame	96.00	hours
Total M1+M4 100-year 24-hr Storm Volume	1.96E+07	gallons
M1 SWPS Firm Pumping Capacity Requirement	3,394.50	GPM
M1 SWPS Firm Pumping Capacity Requirement	**7.56**	**CFS**

System Curve Calculations

System Curve Calculations

Design Flow

$Q_{Design\ High\ Flow\ Pump\ Capacity}$ = 3,360.00 gpm

Number of Operating Pumps = 5.00

Minimum Static Head

$H_{static,\ min}$ = Pump On Elevation - Highest Point on FM

$H_{static,\ min}$ = 0.30 ft - 28.05 ft

$H_{static,\ min}$ = 27.75 ft

Maximum Static Head

$H_{static,\ max}$ = Pump Off Elevation - Highest Point on FM

$H_{static,\ max}$ = (5.70) ft - 28.05 ft

$H_{static,\ max}$ = 33.75 ft

Notes

From M1 and SDFM record drawings with levee discharge being the highest point. Levee calls for 25.80 CL of 30-inch line. Adding 1 foot above top of pipe as FS

From M1 and SDFM record drawings with levee discharge being the highest point. Levee calls for 25.80 CL of 30-inch line. Adding 1 foot above top of pipe as FS

Pipe Segment 1 - 14-inch Pump Discharge

Notes

Description	Qty	K-Value	K-Value Total
90 deg elbow (R/D=1)	3.00	0.75	2.25
90 deg elbow (R/D=1.5)		0.45	-
45 deg elbow (R/D=1)		0.35	-
45 deg elbow (R/D=1.5)		0.20	-
Swing Flex Check Valve	1.00	1.60	1.60
Plug Valve	1.00	0.40	0.40
		ΣK=	**4.25**

Pipe Segment 1 - 14-inch Pump Discharge

C=	130.00	
Pipe Diameter=	14.00	inches
Pipe Area =	1.07	sq. ft
Pipe Length =	25.00	ft

Assuming CML
DIP per as builts but no pressure class listed

Flow, gpm	Flow, cfs	Velocity, fps	Minor Losses, feet	Friction Losses, feet	Total Dynamic Losses, feet
-	-	-	-	-	-
840.00	1.87	1.75	0.20	0.02	0.22
1,680.00	3.74	3.50	0.81	0.08	0.89
2,520.00	5.61	5.25	1.82	0.17	1.99
3,360.00	7.49	7.00	3.24	0.28	3.52
4,200.00	9.36	8.75	5.06	0.43	5.49
5,040.00	11.23	10.50	7.29	0.60	7.89
6,720.00	14.97	14.00	12.96	1.02	13.97

Pipe Segment 2 - 30-inch SDFM

Description	Qty	K-Value	K-Value Total
90 deg elbow (R/D=1)	6.00	0.75	4.50
90 deg elbow (R/D=1.5)	-	0.45	-
45 deg elbow (R/D=1)	14.00	0.35	4.90
45 deg elbow (R/D=1.5)	-	0.20	-
Flap Gate Check Valve	1.00	0.20	0.20
Plug Valve	-	0.40	-
		ΣK=	**9.60**

Notes

Pipe Segment 2 - 30-inch SDFM

C= 140.00
Pipe Diameter= 29.29 inches
Pipe Area = 4.68 sq. ft

Pipe Length = 5,924.16 ft

AWWA C905 DR-25 30-inch pipe per as built drawings

SDFM is approximately 1.02 miles long. Added 1.10 FS for fittings and bends not specifically called out for in plans

Flow, gpm	Flow, cfs	Velocity, fps	Minor Losses, feet	Friction Losses, feet	Total Dynamic Losses, feet
-	-	-	-	-	-
4,200.00	9.36	2.00	0.60	2.42	3.02
8,400.00	18.71	4.00	2.39	8.74	11.13
12,600.00	28.07	6.00	5.37	18.52	23.89
16,800.00	37.43	8.00	9.55	31.56	41.10
21,000.00	46.79	10.00	14.92	47.71	62.62
25,200.00	56.14	12.00	21.48	66.87	88.35
33,600.00	74.86	16.00	38.19	113.93	152.11

Total Dynamic Head Requirements

Flow per Pump, gpm	System Flow, gpm	Total Head Min feet	Total Head Max feet
-	-	27.75	33.75
840.00	4,200.00	30.99	36.99
1,680.00	8,400.00	39.77	45.77
2,520.00	12,600.00	53.63	59.63
3,360.00	**16,800.00**	**72.38**	**78.38**
4,200.00	21,000.00	95.86	101.86
5,040.00	25,200.00	123.99	129.99
6,720.00	33,600.00	193.84	199.84

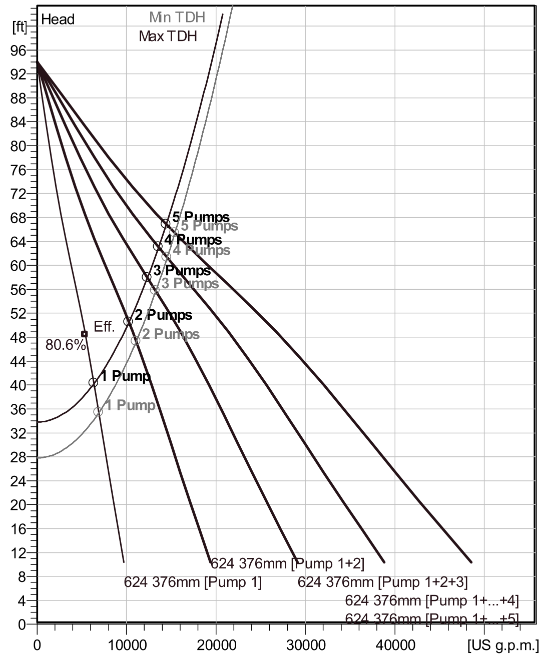
System and Pump Curve Elevation

NP 3301 LT 3~ 624

Patented self cleaning semi-open channel impeller, ideal for pumping in most waste water applications. Modular based design with high adaptation grade.

Technical specification

Curves according to: Water, pure Water, pure [100%],39.2 °F,62.43 lb/ft³,1.6888E-5 ft²/s



Curve: ISO 9906

Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances.
Please consult your local Flygt representative for performance guarantees.

Configuration

Motor number
N3301.095 35-29-6AA-W
85hp

Installation type
P - Semi permanent, Wet

Impeller diameter
376 mm

Discharge diameter
12 inch

Pump information

Impeller diameter
376 mm

Discharge diameter
12 inch

Inlet diameter
350 mm

Maximum operating speed
1185 rpm

Number of blades
2

Max. fluid temperature
40 °C

Material

Impeller
Hard-Iron

Project	Xylect-20748672	**Created by**	Thomas Mihara		
Block	0	**Created on**	10/11/2024	**Last update**	10/11/2024

NP 3301 LT 3~ 624

Technical specification

Motor - General

Motor number N3301.095 35-29-6AA-W 85hp	**Phases** 3~	**Rated speed** 1185 rpm	**Rated power** 85 hp
Approval FM	**Number of poles** 6	**Rated current** 109 A	**Stator variant** 1
Frequency 60 Hz	**Rated voltage** 460 V	**Insulation class** H	**Type of Duty** S1
Version code 095			

Motor - Technical

Power factor - 1/1 Load 0.80	**Motor efficiency - 1/1 Load** 91.3 %	**Total moment of inertia** 28.7 lb ft²	**Starts per hour max.** 30
Power factor - 3/4 Load 0.75	**Motor efficiency - 3/4 Load** 91.7 %	**Starting current, direct starting** 685 A	
Power factor - 1/2 Load 0.64	**Motor efficiency - 1/2 Load** 90.9 %	**Starting current, star-delta** 228 A	

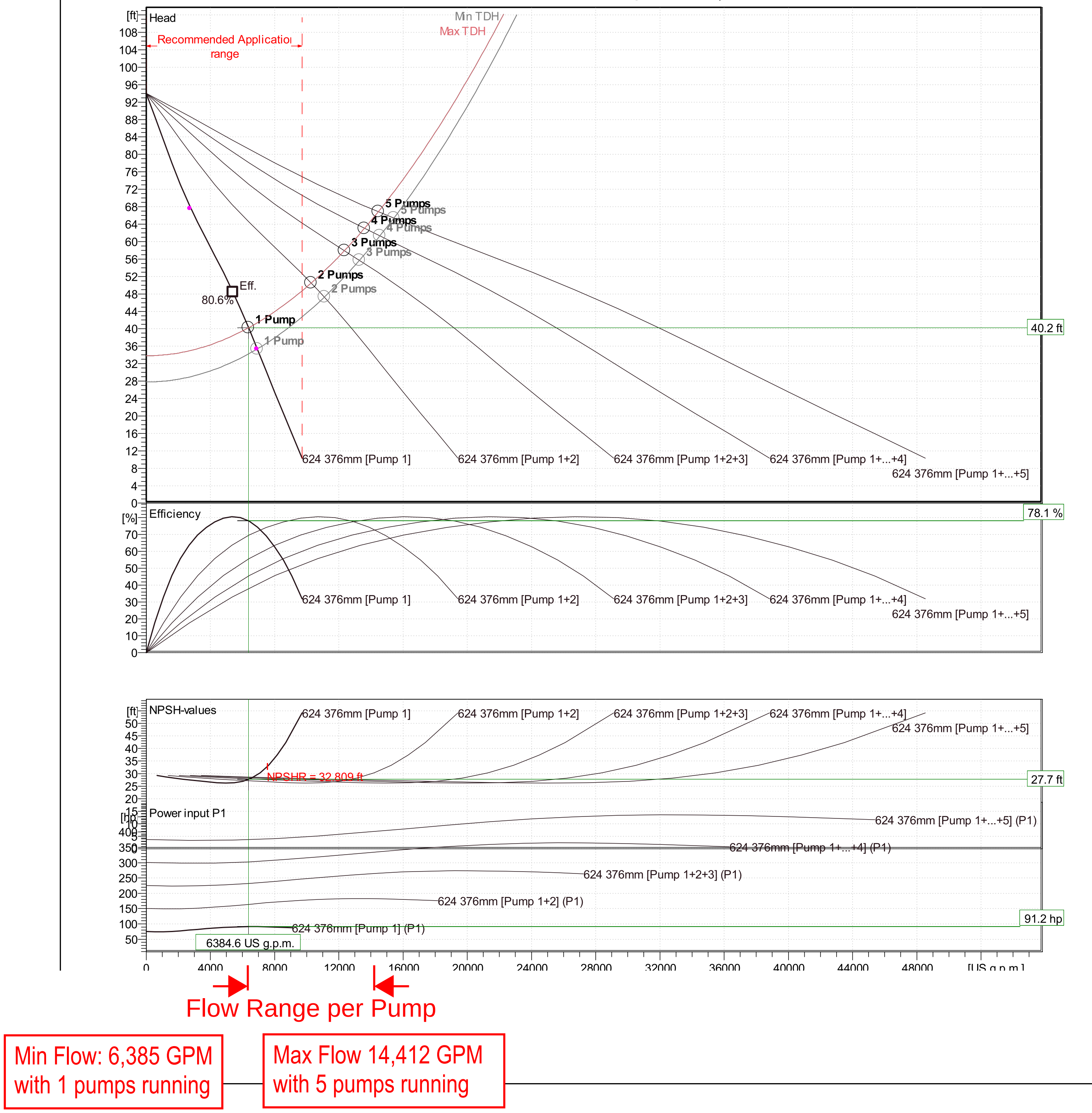
NP 3301 LT 3~ 624

Performance curve

Duty point

Flow	Head
1280 US g.p.m.	40.2 ft

Curves according to: Water, pure Water, pure [100%],39.2 °F,62.43 lb/ft³,1.6888E-5 ft²/s

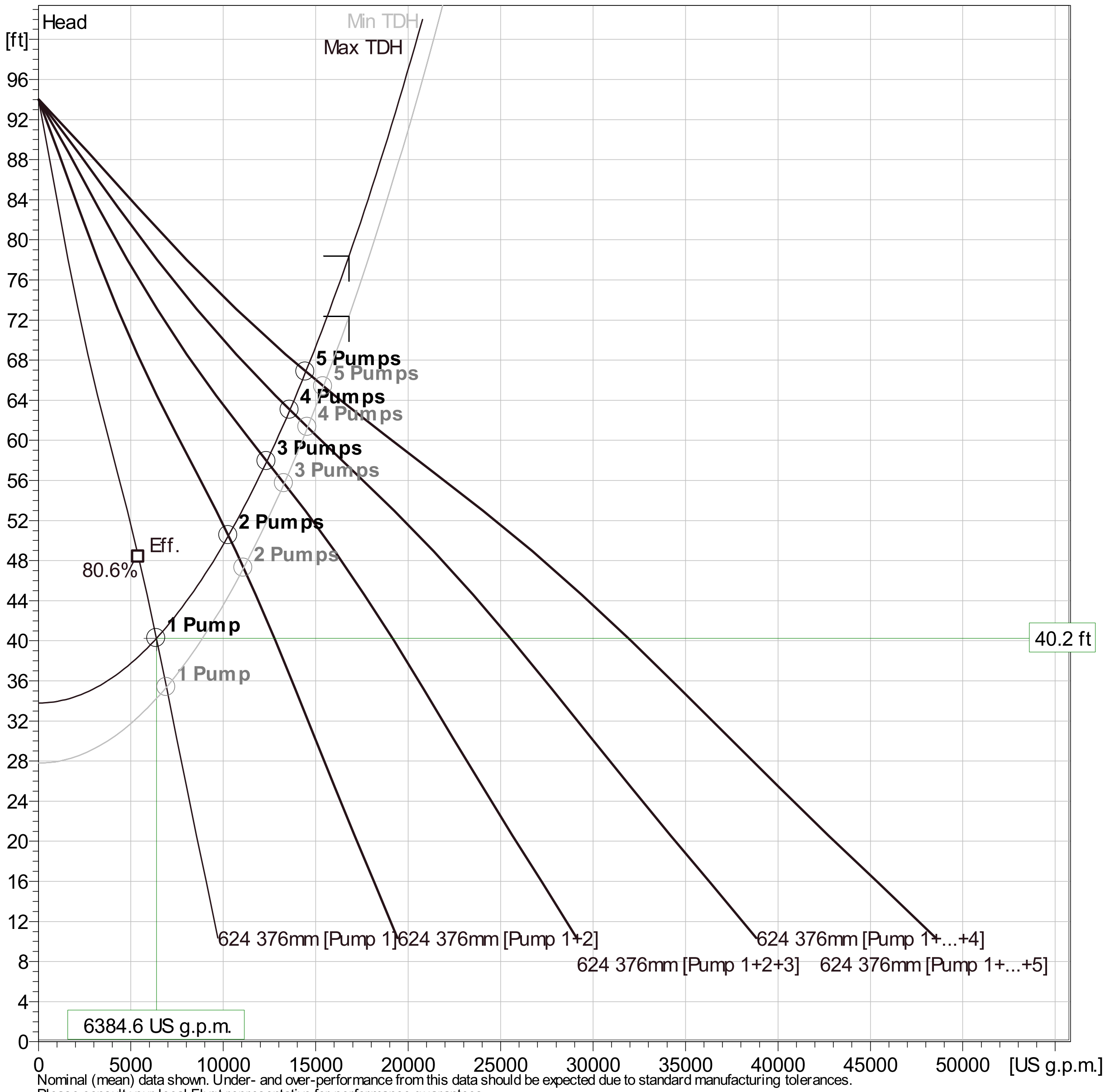


NP 3301 LT 3~ 624

Duty Analysis

FLYGT
a xylem brand

Curves according to: Water, pure [100%] ; 39.2°F; 62.43lb/ft³; 1.6888E-5ft²/s



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances.
Please consult your local Flygt representative for performance guarantees.

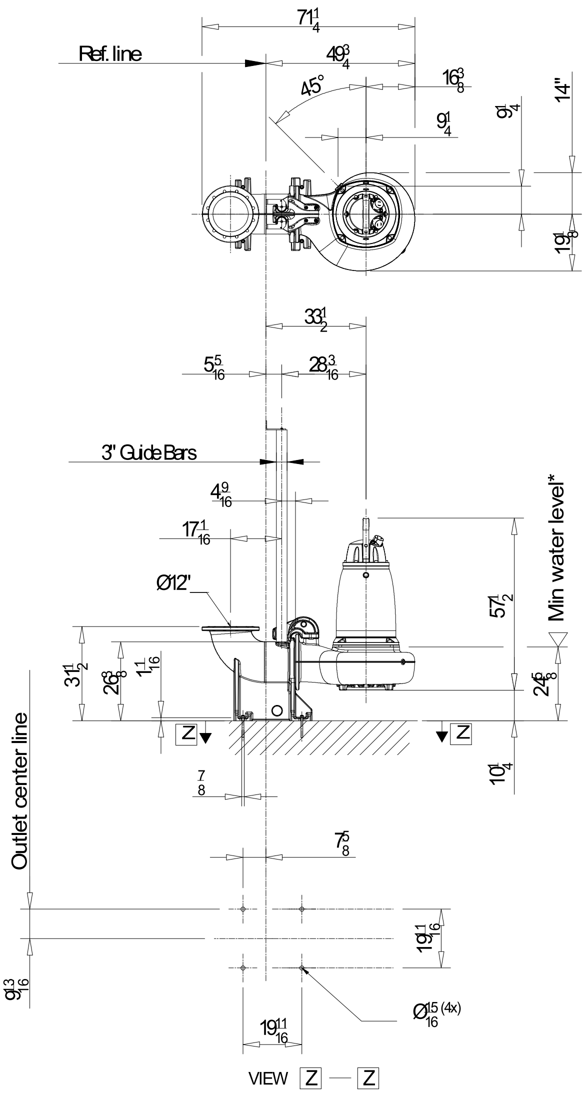
Operating characteristics

Pumps / Systems	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Spec. Energy	NPSHre
	US g.p.m.	ft	hp	US g.p.m.	ft	hp		kWh/US MG	ft
4 / Min TDH	3640	61.3	76.9	14600	61.3	307	73.5 %	287	26.8
3 / Min TDH	4430	55.7	79.8	13300	55.7	239	78.3 %	245	26.4
2 / Min TDH	5550	47.3	82.5	11100	47.3	165	80.5 %	202	26.4

Project		**Created by**	Thomas Mihara		
Block	Xylect-20748672	**Created on**	10/11/2024	**Last update**	10/11/2024

NP 3301 LT 3~ 624

Dimensional drawing



* Only applicable for intermittent duty.
Consult the IOM for more info.

Weight (lbs)	Pump	Discharge
with cooling jacket	2230	645
without cooling jacket	2075	645

NP	3301	LT	Discharge outlet Ø12"	Scale 1:40	Date 230908
090, 095, 180, 185, 660, 670			Pump outlet Ø12" / Pump inlet / Suction inlet	Drawing number 6844600	Revision 14

Project	Xylect-20748672	**Created by**	Thomas Mihara
Block	0	**Created on**	10/11/2024 **Last update** 10/11/2024

Mechanical Screen Evaluation

Mossdale M1 SDPS - Trash Rack Analysis

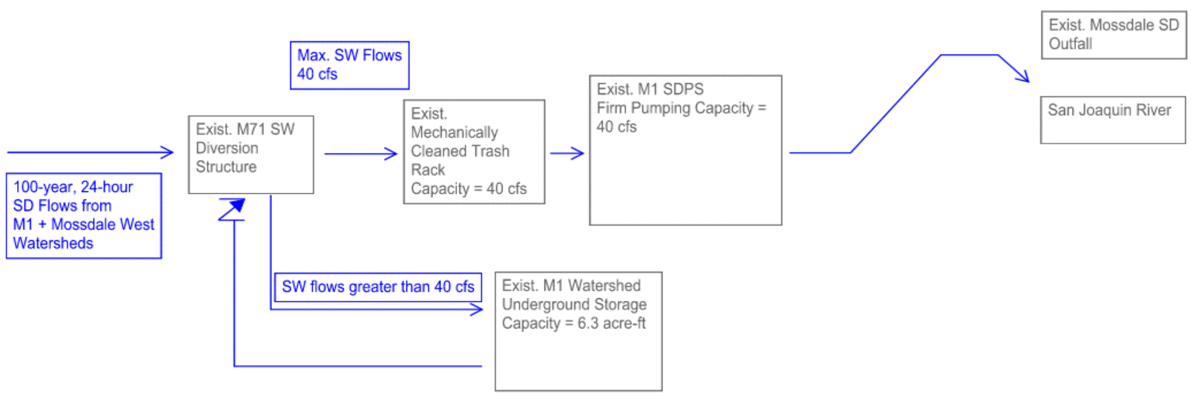
Required Detention Basin Storage Capacity

Per 2022 City Standards Appendix H Section A 2.

Parameter	Value	Units	Notes

2. Pumps shall be preceded by trash racks. Pump stations with capacities exceeding 1.0 cfs shall be equipped with mechanically cleaned trash racks. Trash racks shall have 2-inch clear openings between bars and shall be designed so that the velocity through a clean rack does not exceed 1.0 feet per second under any operating conditions. Manually cleaned trash racks shall be designed so that the velocity through a clean rack does not exceed 0.5 feet per second.

Storm Water Process Flow



Mossdale M1 SDPS - Trash Rack Analysis

Exist. Trash Rack Capacity Check

Max Flow Rate Through Screen	40.00	cfs	Controlled by firm pumping capacity of existing M1 Pump station
Channel Width	6.00	feet	Per As built drawings
Maximum Upstream Water Depth in Channel allowed by screen manufacturer	10.00	feet	Per Shop Drawing of Screen
Minimu Water Elevation when pumps running at full capacity	0.30	feet	Per As built drawings
Wet Well Invert Elevation	(8.70)	feet	Per As built drawings
Minimum Water Depth when pumps are running at full capacity	9.00	feet	
Minimum Flow Area through screen when pumps running at full capacity	54.00	sq. ft	
Maximum Velocity through screen when pumps running at full capacity	0.74	fps	
Meets City and Manufacturer Maximum Velocity?	**Yes**		