LaTourette Subdivision
Public Draft Environmental Impact Report

SCH No. 1995123048
Monterey, California





Lead Agency

County of Monterey
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Table of Contents

Chapter 1 Introduction 1-1

Chapter 2 Summary 2-1

Chapter 3 Project Description 3-1

Chapter 4 Environmental Setting, Impacts and Mitigation Measures 4-1

Section 4.1 Aesthetics 4.1-1
Section 4.2 Air Quality 4.2-1
Section 4.3 Biological Resources 4.3-1
Section 4.4 Cultural Resources 4.4-1
Section 4.5 Energy 4.5-1
Section 4.6 Geology and Soils 4.6-1
Section 4.7 Greenhouse Gas Emissions 4.7-1
Section 4.8 Hazards and Hazardous Materials 4.8-1
Section 4.9 Hydrology and Water Quality 4.9-1
Section 4.10 Land Use, Population, and Housing 4.10-1
Section 4.11 Noise and Vibration 4.11-1
Section 4.12 Public Services 4.12-1
Section 4.13 Transportation 4.13-1
Section 4.14 Wastewater Disposal 4.14-1
Section 4.15 Water Supply 4.15-1

Chapter 5 CEQA Considerations 5-1

Chapter 6 Alternatives 6-1

Chapter 7 References 7-1

List of Figures

3-1 Regional Map 3-2
3-2 Vicinity Map 3-3
3-3 Vesting Tentative Map 3-5
3-4 Comparison of Original and Revised VTMs 3-6
3-5 Surrounding Land Uses 3-7
3-6 Grading Plan 3-10
3-7 Circulation Network 3-12
3-8 Septic Envelopes 3-14
4.1-1 Aerial Map 4.1-3
4.1-2 Site Photographs 4.1-4
4.1-3 Key Observation Points 4.1-8
4.1-4 KOP#1: Intersection of Pesante Road and North King Road 4.1-11

4.1-5 KOP #2: Intersection of North King Road and Alternative Access Road. 4.1-12
4.1-6 KOP #3: Woodland Heights Crt. looking into Project Site 4.1-14
4.3-1 Habitat Types 4.3-7
4.6-1 Regional Geologic Map 4.6-3
4.6-2 Soils Map 4.6-6
4.6-3 Erosion Potential Map 4.6-7
4.6-4 Topographic Index Map 4.6-8
4.6-5 Project Site Drainage 4.6-9
4.6-6 Regional Seismicity Map 4.6-11
4.6-7 Liquefication Potential Map 4.6-13
4.7-1 California GHG Emissions Inventory by Scoping Plan Sector 4.7-4
4.7-2 California Black Carbon Emissions Inventory (Year 2013) 4.7-5
4.8-1 Fire Hazard Map 4.8-3
4.11-1 Noise Measurement Locations 4.11-3
4.13-1 Project Study Area/Local Roadway Network 4.13-3
4.13-2 Existing Conditions Peak Traffic Volumes 4.3-10
5-1 Cumulative Project Locations 5-4
6-1 Applicant Proposed Alternative 6-5
6-2 Modified Density Alternative 6-12
6-3 Reduced Density Alternative 6-17

List of Tables

1-1 La Tourette Subdivision Project Notice of Preparation Comments 1-5
2-1 Summary of Significant Environmental Impacts and Mitigation 2-4
3-1 Gross Lot Area, Septic Envelope Square Footage, and Scenic Easement Acreage 3-8
4.1-1 Summary of Aesthetics Environmental Impacts and Mitigation 4.1-1
4.1-2 Summary of Key Observation Points 4.1-10
4.2-1 Summary of Air Quality Environmental Impacts and Mitigation 4.2-1
4.2-2 Toxic Air Contaminants 4.2-5
4.2-3 NCCAB Attainment Status Designations 4.2-9
4.2-4 Summary of Ambient Air Quality Monitoring Data 4.2-10
4.2-5 Summary of Ambient Air Quality Standards 4.2-11
4.2-6 Construction Emissions of Criteria Air Pollutants 4.2-18
4.2-7 Operational Emissions of Criteria Air Pollutants 4.2-19
4.3-1 Summary of Biological Resources Impacts and Mitigation 4.3-1
4.3-2 Biological Surveys Conducted within the Project Site 4.3-2
4.3-3 Site Habitat Acreages 4.3-6
4.3-4 Estimated Native and Non-Native Tree Population 4.3-19
4.4-1 Summary of Cultural and Tribal Resources Environmental Impacts and Mitigation 4.4-1
4.5-1 Summary of Energy Impacts and Mitigation 4.5-1
4.6-1 Summary of Geology & Soils Environmental Impacts and Mitigation 4.6-1
4.6-2 Modified Mercalli Intensity Scale 4.6-10

4.7-1	Summary of Greenhouse Gas Emissions Environmental Impacts and Mitigation	4.7-1
4.7-2	Global Warming Potential for GHGs	4.7-3
4.7-3	Construction Emissions of GHGs	4.7-14
4.7-4	Operational Emissions of GHGs – Year 2025	4.7-14
4.8-1	Summary of Hazards and Hazardous Materials Environmental Impacts and Mitigation	4.8-1
4.9-1	Summary of Hydrology & Water Quality Impacts and Mitigation	4.9-1
4.9-2	Projected Future Increases over Historical Mean Precipitation, Central Coast Hydrologic Region	4.9-2
4.9-3	Pre-Development Peak Storm Discharges	4.9-3
4.9-4	Pre- and Post-Development Peak Flows	4.9-15
4.9-5	Minimum Storage Requirements for Detention Basins	4.9-16
4.10-1	Summary of Land Use, Population, and Housing Environmental Impacts and Mitigation	4.10-1
4.10-2	Current and Projected Population Summary By Jurisdiction	4.10-2
4.10-3	Housing Stock in Monterey County (Dwelling Units)	4.10-3
4.10-4	Project Consistency with Relevant County of Monterey General Plan Land Use Policies	4.10-5
4.10-5	Project Consistency with Relevant North County Area Plan Land Use Policies	4.10-12
4.11-1	Summary of Noise and Vibration Environmental Impacts and Mitigation	4.11-1
4.11-2	1982 General Plan Land Use Compatibility Noise Criteria	4.11-5
4.11-3	1982 General Plan Noise Zone Definitions	4.11-5
4.11-4	Typical Construction Equipment Noise Emission Levels	4.11-8
4.12-1	Summary of Public Services Environmental Impacts and Mitigation	4.12-1
4.12-2	Current Student Enrollment	4.12-3
4.12-3	Projected Student Generation	4.12-7
4.13-1	Summary of Transportation/Traffic Environmental Impacts and Mitigation	4.13-2
4.13-2	LOS Criteria for Merge and Diverge Segments	4.13-7
4.13-3	HCM 2010 Signalized Intersection Level of Service Definitions	4.13-7
4.13-4	HCM 2010 Unsignalized Intersection with Two-Way Stop Control (TWSC) Level of Service Definitions	4.13-8
4.13-5	HCM 2010 Freeway Segments Level of Service Definitions	4.13-8
4.13-6	Existing Level of Service at Study Intersections	4.13-9
4.13-7	Road Segment Levels of Service	4.13-11
4.13-8	Pesante Road Single Family Residential Trip Generation Rates	4.13-12
4.13-9	La Tourette Subdivision Trip Generation Estimates	4.13-13
4.13-10	Trip Generation	4.13-16
4.13-11	Level of Service for Existing and Project Conditions	4.13-17
4.13-12	Trip Generation of Cumulative Project	4.13-18
4.13-13	Level of Service for Existing and Cumulative without Project Conditions	4.13-19

4.13-14	Road Segment Levels of Service for Existing and Cumulative without Project Conditions	4.13-20
4.13-15	Level of Service for Existing and Cumulative with Project Conditions	4.13-21
4.13-16	Road Segment Levels of Service for Existing and Cumulative with Project Conditions	4.13-22
4.13-17	Project Access Road Analysis	4.13-24
4.14-1	Summary of Wastewater Disposal Impacts and Mitigation	4.14-1
4.14-2	OWTS Horizontal Setback Requirements	4.14-4
4.14-3	Allowable Average Densities per Subdivision	4.14-5
4.14-4	Minimum Lot Size and Estimated Nitrogen Loading	4.14-5
4.14-5	Percolation Test Data, Proposed Lots 11-19	4.14-7
4.14-6	La Tourette Septic System Design Summary, 2020	4.14-10
4.14-7	Groundwater Separation Requirements by Lot	4.14-13
4.14-8	Resultant Groundwater Nitrate Concentration Beneath the Site	4.14-17
4.14-9	Comparison of Groundwater-Nitrate Concentration for Reduced Number of Lots and Supplemental Treatment on One Parcel	4.14-18
4.15-1	Summary of Water Supply Impacts and Mitigation	4.15-1
4.15-2	Water Demand Summary – Existing Conditions	4.15-4
4.15-3	Water Quality Data - Woodland Heights MWC, 2016 – 2020 Main Well #2 (raw water, except as noted)	4.15-6
4.15-4	Water Demand Summary – Existing Conditions and Future Demand	4.15-10
4.15-5	Groundwater Recharge Summary (Acre-Feet Per Year)	4.15-12
4.15-6	Water Balance Summary	4.15-12
5-1	Cumulative Project List in the North County Area	5-5
6.1-1	Comparison of Impacts – Project Alternatives	6-2
6.4-1	Gross Lot Area, Building Envelope Square Footage, and Septic Envelope Square Footage Comparison	6-6
6.4-2	Water Demand Summary	6-11

Appendices

Appendix A	Notice of Preparation (NOP)
Appendix B	Air Quality and Greenhouse Gas Analysis
Appendix C	Association of Monterey Bay Area Governments Consistency Letter
Appendix D	Staub Forest Management Plan
Appendix E	Updates to Existing Forest Management Plan
Appendix F	CNDDB Report
Appendix G	IPaC Resource List
Appendix H	Species Table
Appendix I	Geotechnical Report
Appendix J	Noise Analysis
Appendix K	Water Balance Analysis
Appendix L	Traffic Analysis
Appendix M	VMT Study

Chapter 1 INTRODUCTION

1.1 AUTHORIZATION AND PURPOSE

The County of Monterey ("County") is acting as the Lead Agency responsible for preparing the Environmental Impact Report ("EIR") for the La Tourette Subdivision Project ("Project" or "Proposed Project"). The County prepared this Draft Environmental Impact Report ("DEIR") in conformance with the California Environmental Quality Act ("CEQA") of 1970, as amended (Public Resources Code, Sec. 21000 et seq.). CEQA requires the preparation of an EIR when there is substantial evidence that a project could have a significant effect on the environment.

The purpose of this EIR is to inform the public and decision makers of the potential significant environmental effects associated with the Proposed Project, identify ways to minimize those effects, and describe reasonable alternatives that would feasibly attain most of the basic objectives of the Proposed Project. CEQA Guidelines Sec. 15382 defines a "significant effect on the environment" as:

> "... a substantial, or potentially substantial adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."

An EIR is an informational document for use by decision-makers and the general public that fully discloses the potential environmental effects of a project (CEQA Guidelines Sec. 15121). The EIR process is specifically designed to evaluate the potentially significant direct, indirect, and cumulative effects of a project, and to describe reasonable alternatives to the project that could avoid or reduce those effects while feasibly attaining most of the project's basic objectives.

According to CEQA Guidelines Sec. 15021, public agencies are charged with the duty to avoid or minimize environmental damage where feasible. In determining whether changes in a project are feasible, the public agency may consider specific economic, environmental, legal, technological, and social factors. In addition, CEQA requires that an EIR identify any adverse impacts that would remain significant after mitigation (CEQA Guidelines Sec. 15126).

1.2 ENVIRONMENTAL REVIEW PROCESS

CEQA requires that a Lead Agency prepare an EIR when the Lead Agency determines that there is evidence that a project may have a significant effect on the environment. The County established the need to prepare an EIR for the project as a result of a preliminary evaluation of the likely environmental effects of the Proposed Project. The County, as the Lead Agency, prepared this EIR to inform the public of the potential significant environmental effects of the proposed project, identify possible ways to minimize the significant effects, and describe a reasonable range of project alternatives.

1.2.1 NOTICE OF PREPARATION

The County, as Lead Agency, previously notified all responsible and trustee agencies, interested groups, and individuals that an EIR for the Proposed Project would be prepared. The County used the following methods to solicit input during the preparation of the EIR:

- A Notice of Preparation ("NOP") was filed with the State Clearinghouse on July 20, 2004. The California State Clearinghouse assigned the proposed EIR Clearinghouse Number # 1995123048.
- A NOP was circulated by the County in July and August of 2004 to interested agencies and organizations for the required 30-day review period. **Table 1-1** includes a summary of NOP comments. The County considered all comments relating to environmental considerations during the preparation of this EIR. **Appendix A** includes a copy of the NOP and comments received by the County during the public review period.

1.2.2 PUBLIC REVIEW AND RESPONSE TO COMMENTS

This EIR will be circulated for agency and public review during a 45-day public review period. The County will consider all comments received on this EIR and the County will provide written responses to comments in a Final EIR consistent with the requirements of CEQA Guidelines Sec. 15088. Written responses to comments will be sent to those public agencies that provided timely comments on the EIR at least 10 days prior to certification of the Final EIR.

According to CEQA Guidelines Sec. 15151, the adequacy of an EIR is judged by the following standards:

> "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 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 experts. The courts have not looked for perfection but for adequacy, completeness, and a good faith effort at full disclosure."

1.2.3 CERTIFICATION OF THE EIR

The County, as Lead Agency, will review and consider the Final EIR. If the concludes that the Final EIR reflects the County's independent judgment and has been prepared in accordance with CEQA and the CEQA Guidelines, the County will certify the Final EIR. (CEQA Guidelines Sec. 15090.) As noted previously, the County is required to consider the information in the EIR, along with any other available information, in making its decision (CEQA Guidelines Sec. 15121). Although the EIR does not control the Lead Agency's ultimate decision on a project, the County must consider the information in the EIR and respond to each significant effect identified in the EIR.

A decision to approve the Proposed Project would be accompanied by written findings prepared in accordance with CEQA Guidelines Sec. 15091, and if applicable, CEQA Guidelines Sec. 15093. If significant adverse

environmental effects are identified in the EIR, approval of the Proposed Project must be accompanied by written findings, as follows:

A. Changes or alterations have been required in, or incorporated into, such project that mitigate or avoid the significant environmental effects thereof as identified in the completed EIR.

B. Such changes or alterations are within the responsibility and jurisdictions of another public agency and such changes have been adopted by such other agency or can and should be adopted by such other agency.

C. Specific economic, social, or other considerations make infeasible the mitigation measures or project alternatives identified in the EIR.

The findings of fact prepared by the Lead Agency must be based on substantial evidence in the administrative record and must include an explanation of any differences between evidence in the record and the conclusions required by CEQA (CEQA Guidelines Sec. 15091(b)). For each significant effect identified in the EIR, the findings will describe whether it can be reduced to a less-than-significant level through feasible mitigation measures and if not, why there are no feasible mitigation measures or alternatives to reduce the effect to a less-than-significant level. No aspect of the Proposed Project will be approved until after the Final EIR is considered. If the County approves a project with significant effects on the environment that cannot be feasibly avoided or reduced to less-than-significant levels, the County must also adopt a Statement of Overriding Considerations (CEQA Guidelines Sec. 15092(b)(2)(B); see also CEQA Guidelines Sec. 15093). A Statement of Overriding Considerations explains why the Lead Agency determines that the benefits of the project outweigh the unavoidable environmental impact of the project (CEQA Guidelines Sec. 15093)

1.2.4 MITIGATION MONITORING AND REPORTING PROGRAM

CEQA also requires that a public agency adopt a monitoring program for mitigation measures that have been incorporated into a project to reduce or avoid significant effects on the environment (CEQA Guidelines Sec. 15097). The Mitigation Monitoring and Reporting Program ("MMRP") describes how each of the mitigation measures will be implemented and provides a mechanism for monitoring and/or reporting on their implementation. The purpose of the MMRP is to ensure compliance with environmental mitigation measures during project implementation and operation. The plan describes monitoring and reporting procedures, monitoring responsibilities, and monitoring schedules for all mitigation measures identified in the Draft EIR. The Final EIR will include a monitoring program for any mitigation measures identified in this EIR, if applicable. Any mitigation measures adopted by the County as conditions of approval for the Proposed Project will be included in a MMRP to verify compliance.

1.3 PROJECT OVERVIEW

The proposed LaTourette Subdivision consists of the development of a 19-lot low-density residential subdivision located in the unincorporated area of northern Monterey County. The proposed subdivision is considered a "project" as defined by CEQA Guidelines Sec. 15378, which states "[Project] means the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment." The residential development would consist of the division of an approximately 47.57-acre parcel into 19 lots, ranging in size from 1.17 to 5.3 acres with an average size of 2.4 acres. The project would also involve expansion of the existing Woodland Heights

Mutual Water System and construction of infrastructure including vehicular access roads, water and utility lines, and drainage facilities. The Proposed Project consists of 1) Standard Subdivision Vesting Tentative Map; 2) Use Permit for expansion of the Woodland Heights Mutual Water System to provide 19 additional water connections necessary to serve the Proposed Project; and 3) Use Permit for tree removal.

1.4 SCOPE AND CONTENT

Consistent with CEQA Guidelines Sec. 15161, this EIR is a "Project EIR" that evaluates the environmental impacts of the Proposed Project. **Chapter 4.0, Environmental Setting**, includes a discussion of the environmental setting, potential impacts, and mitigation measures for each of these topical CEQA sections. This EIR focuses on those effects of the Project that may be potentially significant; effects not found to be significant (CEQA Guidelines Sec. 15128) are discussed is **Chapter 5.0, CEQA Considerations**. This EIR evaluates the Proposed Project's potential impacts to:

- Aesthetics
- Air Quality
- Biological Resources,
- Cultural and Tribal Resources
- Geology and Soil Resources
- Greenhouse Gases
- Hazardous Materials
- Hydrology and Water Quality Resources
- Land Use
- Noise
- Public Services
- Transportation
- Wastewater Disposal
- Water Supply Resources

Chapter 5.0, CEQA Considerations includes the following CEQA-required elements (CEQA Guidelines Sec. 15126.2):

- Growth-Inducing Effects
- Significant Irreversible Effects
- Significant and Unavoidable Effects

Chapter 5.0, CEQA Considerations also includes an evaluation of the Proposed Project's potential cumulative effects (CEQA Guidelines Sec. 15130). This EIR includes an evaluation of Project alternatives in **Chapter 6.0, Alternatives** (CEQA Guidelines Sec. 15126.6).

- Alternative 1: No Project
- Alternative 2: Applicant Proposed Alternative
- Alternative 3: Modified Design Alternative
- Alternative 4: Reduced Density Alternative

1.5 SUMMARY OF NOP COMMENTS

As required by State CEQA Guidelines Sec. 15082, the County issued a NOP on July 20, 2004, that described the Proposed Project, stated its intention to prepare an EIR, and requested comments from interested parties. The NOP was filed with the State Clearinghouse on July 20, 2004 (SCH #1995123048), starting a 30-day public scoping period. The review period for the NOP ended on August 18, 2004. The County received Four (4) letters in response to the NOP. The comments received during this public scoping process are summarized in **Table 1-1** below. The table includes all comments pertinent to CEQA. Comments related to the merit of the Proposed Project are outside the purview of CEQA and are, therefore, excluded from this table. The NOP prepared for the project and all comment letters received are presented in **Appendix A**.

Table 1-1
La Tourette Subdivision Project
Notice of Preparation Comments

Name	Date	Affiliation	Summary
Janet Brennan	July 23, 2004	Monterey Bay Unified Air Pollution Control District	This letter makes recommendations for the air quality analysis and requests that operational and construction source emissions are assessed, traffic emissions are evaluated, and to identify mitigation measures and evaluate effectiveness of such measures to reduce significant impacts to less than significant. This letter also requests that the project be consistent with the population forecasts from the *2004 Air Quality Management Plan for Monterey Bay Region.*
Keith Hinrichsen	August 16, 2004	California Department of Transportation	This letter makes recommendations for the draft environmental impact report and includes: inclusion of U.S. Route 101 and Pesante Road within the operational analysis, utilizing of the Departments LOS standards for determining and calculating LOS, utilizing the latest edition of the *Trip Generation Report.,* utilizing the existing traffic volumes within the study area for the analysis, including the cumulative impacts to the study area, and including mitigation measures to allow the community to assimilate the project.
Keith Hinrichsen	August 25, 2004	California Department of Transportation	This comment states the Department supports the pro-rata share contribution. This comment also states that the Department disagrees with the statement that the sixteen trips would have a less than significant impact. Any additional trips would be significant in that corridor. Lastly, the Department would like to be notified when the pro-rata share contribution is received by the County and deposited in the Developer Traffic Fees account.
Robert Floerke	August 6, 2004	California Department of Fish and Game	This comment provides notification of changes to California Code of Regulations, Title 14, Section 753.5(d)(1)(A) –(G)[1] and provides instruction for filing the environmental filing fee as required by Fish and Game code Section 711.4(d). A complete assessment of the flora and fauna within and adjacent to the project area should be provided and be consistent with CEQA guidelines Section 15380. A Streambed Alteration Agreement may be required pursuant to Section 1600 et. seq. of the Fish and Game Code.

1.6 INTENDED USE OF THIS EIR

This EIR evaluates the environmental impacts of the project. This EIR is an informational document for use by decision-makers and the general public to disclose the potential environmental effects of the Project. The CEQA process is designed to evaluate the potentially significant direct, indirect, and cumulative impacts of the project and describe reasonable alternatives to the Proposed Project that could avoid or reduce those impacts. This document is intended to 1) support the decision-making process of the County, and 2) disclose the Project's potential environmental effects in accordance with the requirements of CEQA.

Chapter 2. SUMMARY

2.1 INTRODUCTION

CEQA Guidelines Sec. 15123(a) states that "an EIR shall contain a brief summary of the proposed action and its consequences." CEQA Guidelines Sec. 15123(b) further states that the summary shall identify: each significant effect with proposed mitigation measures and alternatives that would reduce or avoid that effect (CEQA Guidelines Sec. 15123(b)(1)); areas of controversy known to the Lead Agency (CEQA Guidelines Sec. 15123(b)(2)); and, issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects (CEQA Guidelines Sec. 15123(b)(3)). This summary provides a brief description of the Proposed Project, alternatives, and the significant impacts identified as part of the environmental analysis. This section also provides an overview of areas of known controversy. This summary is intended as an overview. For a more comprehensive evaluation of the Proposed Project and its corresponding environmental effects, please refer to the topical CEQA sections included in this EIR. The information contained in the following chapters of this EIR serves as the basis for this summary.

2.2 SUMMARY OF PROJECT DESCRIPTION

The Proposed Project consists of a 19-lot residential subdivision in unincorporated Monterey County, CA. The Project site is in a rural area of northern Monterey County known as the Prunedale., within the boundaries of the North County Area Plan ("NCAP"). The Project site is north of the Pesante Road/North King Road intersection, approximately two (2) miles east of Highway 101. The Project consists of the construction of a residential development resulting from the division of an approximately 47.57-acre parcel into 19 lots, which would range in size from 1.17 to 5.3 acres with an average of 2.4 acres. The property is zoned Low Density Residential (2.5 acres/unit). Existing development on the site includes three single-family residences and supporting structures and infrastructure. A full project description is provided in **Chapter 3.0, Project Description**, of this EIR.

2.3 ALTERNATIVES EVALUATED IN THIS EIR

CEQA Guidelines Sec. 15126.6 requires the consideration of a range of reasonable alternatives to the proposed project that could feasibly attain most of the basic project objectives and would avoid or substantially lessen the significant effects of the project. The discussion of alternatives should focus on alternatives capable of eliminating the significant adverse impacts of the project or reducing them to a less-than-significant level, even if the alternative would not fully attain most of the basic project objectives or would be more costly (CEQA Guidelines Sec. 15126.6(b)). An EIR must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making. The range of potential alternatives is governed by the "rule of reason," which requires the evaluation of alternatives "necessary to permit a reasoned choice" (CEQA Guidelines Sec. 15126.6(f)). The alternatives evaluated in this EIR are summarized below. These alternatives are more fully described in **Chapter 6.0, Alternatives**.

- **No Project Alternative – No Development**: The No Development alternative consists of leaving the site in its current condition. This alternative would avoid all the environmental impacts of the

project, as well as the benefits of the Proposed Project. This alternative would fail to meet any of the project objectives to provide low density housing.

- **Applicant Proposed Alternativ**e: The Applicant Proposed Alternative consists of constructing a 17-lot residential subdivision. Specifically, this alternative would merge Lot 2 and Lot 7 with Lot 16 of the Proposed Project. The merging of these lots would address potential adverse environmental effects associated with on-site wastewater disposal limitation.
- **Modified Design Alternative**: The Modified Design alternative consists of reducing the overall average lot sizes by clustering development to minimize impacts to biological resources, including maritime chaparral and mixed oak woodland habitats. The Modified Design alternative assumes the development of 19 new units on 20 acres of the 47.57-acre site, with a density of 1 acre per unit. This alternative would substantially reduce the impact of the project on sensitive biological resources and would reduce grading and construction-related impacts. This alternative would meet the objectives of the Proposed Project by providing a low density rural residential subdivision that would help the County achieve state mandated housing needs.
- **Reduced Density Alternative**: This alternative consists of reducing development on the site to avoid significant impacts related to biological resources, on-site septic disposal, and transportation related effects. This alternative would result in the development of a 14-lot residential subdivision. This alternative would result in the elimination of lots 1, 2, 4, 7, and 19. This alternative would eliminate lots 2 and 7 due to wastewater disposal limitations; lots 1, 4, and 19 would be removed to minimize biological impacts. This alternative would meet the objectives of the Proposed Project by providing a low density rural residential subdivision that would help the County achieve state mandated housing needs.

2.4 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires that an environmentally superior alternative to the proposed project be specified if one is identified. In general, the environmentally superior alternative is supposed to minimize adverse effects of the proposed project while achieving the basic project objectives. The No Project Alternative would be environmentally superior to the alternatives evaluated in this EIR since this alternative would avoid all adverse impacts associated with the Proposed Project. This alternative would not, however, achieve the basic project objectives. In addition, CEQA Guidelines Sec. 15126.6(e)(2) states: "If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."

Among the remaining alternatives, the Reduced Density alternative would represent the environmentally superior alternative. This alternative would: 1) reduce the extent of potential impacts to biological resources; 2) eliminate the need for mitigation to address impacts related to wastewater disposal; 3) reduce the extent of water demand on-site; and, 4) reduce potential VMT-related traffic impacts to a less than significant level and would avoid a significant and unavoidable traffic-related impact. This alternative would also reduce impacts in other impact areas due to the elimination of five (5) lots and the corresponding reduction in development.

2.5 SUMMARY OF PROJECT IMPACTS

Table 2-1 summarizes the Proposed Project's significant impacts and mitigation measures. Mitigation measures have been identified to either avoid the impact or reduce the level of significance. Information provided in **Table 2-1** includes the topical area, summary of the impact, and level of significance before and after mitigation is implemented. As a condition of approval, the County of Monterey will require that the Applicant include the final adopted Mitigation Monitoring & Reporting Program ("MMRP") as a "Note" on the Final Map.

Table 2-1
Summary of Significant Environmental Impacts and Mitigation

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-1	The Proposed Project may result in direct and indirect impacts to special-status plants and wildlife, sensitive habitats, and protected trees.	Potentially Significant	**BIO-1a:** A deed restriction shall be recorded for each lot establishing conservation easements in all areas outside of the building/sceptic envelopes, utility easements, detention basins, and other areas planned for subdivision improvements to ensure the long-term protection of the maritime chaparral habitat and/or special-status plant species that: ▪ Prohibits grading, structures, roads, water tanks, surface or subsurface utility lines, or other activities except as may be necessary to reduce the potential risk of wildfires as outlined in the Conservation Easement Habitat Management and Enhancement Plan (see **Mitigation Measure BIO-2c**), to implement the Conservation Easement Habitat Management and Enhancement Plan and/or, with the written approval of a biologist and HCD – Planning Services, to locate utility improvements if necessary to avoid other environmental impacts or construction on grades over 25 percent, and if no significant impact to biological resources would result. ▪ Prohibits the property owner from removing native vegetation and trees, including animal grazing, except as may be necessary during an emergency; to implement the Restoration and Management Plan outlined in **Mitigation Measure BIO-2b** and/or the Conservation Easement Habitat Management and Enhancement Plan outlined in **Mitigation Measure BIO-2c** (e.g., to restore or maintain the vigor, diversity, and value of the habitat; to remove non-native plants; to reduce the potential risk of wildfires; or to otherwise ensure the long-term maintenance of the habitat); with the written approval of a biologist and HCD – Planning Services, to locate utility improvements if necessary to avoid other environmental impacts or construction on grades over 25 percent, and if no significant impact to biological resources would result; or otherwise deemed necessary unless approved in writing by the HCD – Planning Services; ▪ Prohibits motor vehicle and bicycle use, pets, storage, dumping, or any other activities within the conservation easements that could adversely affect the ecological and scenic importance of these easements; and ▪ Discloses to purchasers the ecological and scenic importance of the conservation easements, the presence of special-status plants, and habitat protection measures implemented as part of the development. Prior to recordation of the final map, the Applicant shall submit to the HCD – Planning Services evidence of the deed restriction consistent with this mitigation measure for review and approval. The deed restriction shall be recorded concurrently with the Final Map.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-1	The Proposed Project may result in direct and indirect impacts to special-status plants and wildlife, sensitive habitats, and protected trees.	Potentially Significant	**BIO-1b:** An Exclusionary Fencing Plan shall be prepared by a qualified biologist in order to avoid impacts to sensitive natural resources and other vegetation that are not planned to be removed or impacted by construction of proposed subdivision improvements (including vegetation removal) and lot development. The Exclusionary Fencing Plan shall include the use of temporary construction fencing or flagging, placed to keep construction vehicles and personnel from impacting special-status plant species (as identified during surveys required by **Mitigation Measure BIO-2a** below), special-status wildlife habitat (e.g., nesting birds or MDFW nests), and maritime chaparral and other vegetation outside of work limits. The Exclusionary Fencing Plan shall prohibit dumping of spoils, storage of construction materials or equipment, or disposal of construction related materials beyond the fence lines. The Exclusionary Fencing Plan shall also include requirements for supervision of fencing installation and monitoring by a qualified biologist until construction is complete. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit the Exclusionary Fencing Plan, prepared for both subdivision improvements and lot development in accordance with this mitigation, to the HCD – Planning Services for review and approval. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) and lot development, the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to monitor the installation and condition of exclusionary fencing throughout construction. Prior to commencement of vegetation removal, demolition, and/or grading activities, the Applicant shall submit evidence of implementation of the approved Exclusionary Fencing Plan. The Applicant shall submit monthly monitoring reports during construction to the HCD – Planning Services documenting that protective fencing or flagging is intact. The monitoring reports may be combined with the monthly monitoring reports required by **Mitigation Measure BIO-1e**.	Less than Significant
4.3 Biological Resources	BIO-1	The Proposed Project may result in direct and indirect impacts to special-status plants and wildlife, sensitive habitats, and protected trees.	Potentially Significant	**BIO-1c:** The Applicant shall prepare a Landscaping Plan that maximizes the use of locally occurring, native plants. The Applicant shall not use species in landscaping that are listed on the California Invasive Plant Council's Inventory of Invasive Plants. If irrigation systems are installed, they shall be designed to minimize runoff of irrigation water into adjacent areas of native vegetation subject to the approval of the County. Prior to recordation of the final map, the Applicant shall submit to the HCD – Planning Services evidence that final map includes a note requiring preparation of a Landscaping Plan in accordance with the mitigation above. Prior to the issuance of a building permit for subdivision improvements or lot development, the Applicant shall submit a Landscaping Plan, prepared in accordance with this mitigation, to the HCD – Planning Services for review and approval. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-1	The Proposed Project may result in direct and indirect impacts to special-status plants and wildlife, sensitive habitats, and protected trees.	Potentially Significant	**BIO-1d:** A qualified biologist shall conduct an Employee Education Program for the construction crew (including subcontractors) prior to initiation of construction activities for subdivision improvements (including vegetation removal) or lot development. The qualified biologist shall meet with the construction crew at the onset of construction at the project site to educate the construction crew on the following: 1) the appropriate access route(s) in and out of the construction area and review project boundaries; 2) how a biological monitor will examine the area and agree upon a method which will ensure the safety of the monitor during such activities; 3) the identification of special-status species and other sensitive natural resources that may be present; 4) the specific mitigation measures that will be incorporated into the construction effort; 5) the general provisions and protections afforded; and 6) the proper procedures if a special-status species is encountered within the project site to avoid impacts. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) or lot development, the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct an Employee Education Program. The Applicant shall also submit a copy of the education program materials to the HCD – Planning Services for review and approval prior to implementation. Within one week of the commencement of these activities, the Applicant shall submit evidence to the HCD – Planning Services documenting that the education program took place. This evidence shall be in the form of a signed list of attendees. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.	Less than Significant
4.3 Biological Resources	BIO-1	The Proposed Project may result in direct and indirect impacts to special-status plants and wildlife, sensitive habitats, and protected trees.	Potentially Significant	**BIO-1e:** The following best management practices ("BMPs") shall be implemented throughout the duration of construction activities for subdivision improvements (including vegetation removal) and lot development: ▪ Grading, excavating, and other activities that involve substantial soil disturbance shall be planned and carried out in consultation with a qualified hydrologist, engineer, or erosion control specialist, and shall utilize standard erosion control techniques to minimize erosion and sedimentation to native vegetation. ▪ To prevent inadvertent entrapment of special-status wildlife species during project construction, all excavated, steep-walled holes or trenches more than two feet deep will be covered at the close of each working day with plywood or similar materials. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. For holes and trenches that it is infeasible to cover, the sidewalls may be a 2:1 slope or greater, or ramps may be placed to allow animals to escape. ▪ Only tightly woven fiber netting or similar material may be used for erosion control at the project site. Coconut coir matting is an acceptable erosion control material. No plastic mono-filament matting will be used for erosion control, as this material may ensnare wildlife, including special-status species. ▪ Because dusk and dawn are often the times when many special-status wildlife species are most actively foraging and dispersing, all construction activities shall cease one half hour before sunset and shall not begin prior to one half hour after sunrise. ▪ All trash that may attract predators shall be properly contained, removed from the construction site, and disposed of weekly. Following construction, all trash and construction debris shall be removed from work areas. ▪ No construction equipment shall be stored, serviced, or fueled outside of designated staging areas. ▪ No pets or firearms shall be allowed on the project site during construction. ▪ The qualified biologist and the construction monitor shall complete a daily log summarizing activities and environmental compliance throughout the duration of the proposed project. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) and lot development, the Applicant shall include the requirements of this mitigation measure as notes on the construction drawings. During all construction activities, the Applicant shall submit monthly monitoring reports to the HCD – Planning Services summarizing daily construction activities and environmental compliance. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-2	The Proposed Project may result in direct impacts to Hickman's onion, Anderson's manzanita, Hooker's manzanita, Pajaro manzanita, sandmat manzanita, Monterey spineflower, Eastwood's goldenbush, Kellogg's horkelia, marsh microseris, northern curly-leaved monardella, Dudley's lousewort, Yadon's rein orchid, saline clover, and Choris's popcornflower, if present within or directly adjacent to the construction footprint.	Potentially Significant	**Please see Mitigation Measures BIO-1a through BIO-1e, above.**	Less than Significant
4.3 Biological Resources	BIO-2	The Proposed Project may result in direct impacts to Hickman's onion, Anderson's manzanita, Hooker's manzanita, Pajaro manzanita, sandmat manzanita, Monterey spineflower, Eastwood's goldenbush, Kellogg's horkelia, marsh microseris, northern curly-leaved monardella, Dudley's lousewort, Yadon's rein orchid, saline clover, and Choris's popcornflower, if present within or directly adjacent to the construction footprint.	Potentially Significant	**BIO-2a:** Prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal), a qualified biologist shall conduct focused botanical surveys with areas of the project site that would be impacted due to ground disturbing activities (e.g., building envelopes, septic envelopes, roadways, driveways, and other areas disturbed in connection with the construction of subdivision improvements) for Hickman's onion, Anderson's manzanita, Hooker's manzanita, Pajaro manzanita, sandmat manzanita, Monterey spineflower, Eastwood's goldenbush, Kellogg's horkelia, marsh microseris, northern curly-leaved monardella, Dudley's lousewort, Yadon's rein orchid, saline clover, and Choris's popcornflower. The surveys shall be conducted during the appropriate blooming periods for these species, as determined by the qualified biologist, in areas that offer suitable habitat. The results of the surveys shall be documented in a supplemental report. All special-status plant species shall be avoided to the greatest extent possible, as outlined in **Mitigation Measures BIO-1a, BIO-1b**, and **BIO-1d**. For special-status plant species that cannot be avoided, **Mitigation Measure BIO-2b** shall be implemented. Prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit the results of focused botanical surveys to the HCD – Planning Services for review and approval.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-2	The Proposed Project may result in direct impacts to Hickman's onion, Anderson's manzanita, Hooker's manzanita, Pajaro manzanita, sandmat manzanita, Monterey spineflower, Eastwood's goldenbush, Kellogg's horkelia, marsh microseris, northern curly-leaved monardella, Dudley's lousewort, Yadon's rein orchid, saline clover, and Choris's popcornflower, if present within or directly adjacent to the construction footprint.	Potentially Significant	**BIO-2b:** Prior to recordation of the final map, impacts to special-status plant species and maritime chaparral shall be quantified based on the results of focused special-status plant surveys conducted in accordance with **Mitigation Measure BIO-2a** and habitat surveys conducted in accordance with **Mitigation Measure BIO-7a**. Impacts to special-status plant species shall be mitigated at a 3:1 ratio for individuals impacted or area impacted, as deemed appropriate by a qualified biologist or restoration specialist. To ensure that no net loss of maritime chaparral habitat as a result of the project, maritime chaparral impacts shall be mitigated through preservation of habitat, restoration of habitat, or a combination of both preservation and restoration. Habitat preservation shall be mitigated at a 2:1 ratio for area impacted, while habitat restoration shall be at a 1:1 ratio for area impacted. Habitat preservation can be satisfied through establishment of conservation easements, as identified in **Mitigation Measure BIO-1a**. The mitigation site(s) for special-status plants and maritime chaparral may be located on- or off-site, or a combination thereof and may be overlapping, as appropriate. A Restoration and Management Plan shall be prepared by a qualified biologist prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal) that mitigates for all impacted special-status plant species and maritime chaparral habitat at the ratios identified above. The Restoration and Management Plan shall include, at a minimum, the following: ▪ a detailed description of on-site and/or off-site mitigation areas; ▪ timing for initiation of Plan activities; ▪ plant source material, including any soil bank salvage; ▪ seeding and planting specifications, including propagation of special-status plant species from on-site stock to supplement the existing populations, as appropriate; ▪ a monitoring program that describes annual monitoring efforts which incorporate success criteria and contingency plans if success criteria are not met; and ▪ frequency and format of monitoring reports to be submitted to the County. The Restoration and Management Plan shall not be terminated until there is verification from a qualified biologist and County staff that such measures have been successfully implemented. The mitigation areas shall be preserved through establishment of conservation easements (as outlined in **Mitigation Measure BIO-1b** for on-site mitigation). Funding for implementation of this mitigation shall be secured prior to the issuance of any grading, demolition, or building permit for the subdivision improvements. Prior to the recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall retain a qualified biologist to quantify impacts to special-status plant species and maritime chaparral habitat, and submit a Restoration and Management Plan to the HCD – Planning Services for review and approval. The Applicant shall arrange for a qualified biologist to implement the Restoration and Management Plan. The biologist shall submit monitoring reports to the HCD – Planning Services for review and approval in accordance with the timelines specified in the Restoration and Management Plan.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-2	The Proposed Project may result in direct impacts to Hickman's onion, Anderson's manzanita, Hooker's manzanita, Pajaro manzanita, sandmat manzanita, Monterey spineflower, Eastwood's goldenbush, Kellogg's horkelia, marsh microseris, northern curly-leaved monardella, Dudley's lousewort, Yadon's rein orchid, saline clover, and Choris's popcornflower, if present within or directly adjacent to the construction footprint.	Potentially Significant	**BIO-2c:** Prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall retain a qualified biologist or restoration specialist to prepare a long-term Conservation Easement Habitat Management and Enhancement Plan for the conservation easement areas. The Plan shall include, at a minimum, the following: ▪ identification of parties responsible for implementation and management of the Plan; ▪ timing for initiation of Plan activities; ▪ identification of all competing non-native species, particularly invasive plant species; ▪ techniques for removing the competing species; ▪ specificity of measures for restoration of disturbed areas with locally-occurring native species in all appropriate areas; ▪ propagation of native plant species from on-site stock to supplement the existing populations, as appropriate; ▪ specificity of measures for vegetation removal to reduce wildfire risk in accordance with local and state policies, including, but not limited to, measures to avoid removal of special-status plant species or loss of maritime chaparral and oak woodland habitat to the extent feasible; ▪ applicable measures from the 2006 Staub FMP and 2021 DD&A FMP for tree protection during management and enhancement activities and oak woodland management; ▪ details of a monitoring plan that contain success criteria and adaptive management measures if those criteria are not met; ▪ frequency and format of monitoring reports to be submitted to the County; and ▪ identification of a funding mechanism for the monitoring and adaptive management components of the plan. Prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit a Conservation Easement Habitat Management and Enhancement Plan, demonstrating consistency with this mitigation measure, to the HCD – Planning Services for review and approval. The Applicant shall contract with a qualified biologist to implement the Conservation Easement Habitat Management and Enhancement Plan. The biologist shall submit an annual letter report to the HCD – Planning Services documenting the ongoing maintenance and protection of the conservation easement areas. If annual monitoring finds that success criteria are not being met, an analysis of the cause(s) of failure shall be prepared by the qualified biologist and if determined necessary, remedial actions will occur. The analysis of the cause(s) of failure and adaptive management plan shall be included in the annual report to the County. The County shall be responsible for reviewing the annual reports to ensure that the Applicant has implemented the habitat protection and maintenance measures specified in the Conservation Easement Habitat Management and Enhancement Plan.	Less than Significant
4.3 Biological Resources	BIO-3	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of pallid bat, Townsend's big-eared bat, Monterey dusky-footed woodrat, and mountain lion, if present within the Project site, and in disturbance and loss of habitat.	Potentially Significant	**Please see Mitigation Measures BIO-1a through BIO-1e and BIO- 2b through BIO-2c, above. See also, BIO-9a through BIO-9b, below.**	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-3	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of pallid bat, Townsend's big-eared bat, Monterey dusky-footed woodrat, and mountain lion, if present within the Project site, and in disturbance and loss of habitat.	Potentially Significant	**BIO-3a:** To the extent practical, limbing/tree removal operations and demolition of abandoned buildings should occur between September 15 and November 1 to avoid bat maternity roosts and winter hibernacula. If tree limbing/tree removal or demolition of abandoned buildings must occur outside the period of September 15 through November 1 a survey for bats shall be conducted by a qualified biologist. Prior to initiation of construction related activities for subdivision improvements (including vegetation removal) and lot development, a qualified biologist shall conduct a pre-construction survey for bats within development areas of the project site (i.e., building/septic envelopes, roadways, driveways, and other areas disturbed in connection with the construction of subdivision improvements) and a 50 foot buffer as follows: ▪ The biologist shall determine if bats are utilizing the development areas or areas within 50 feet for roosting. For any trees/snags/buildings that could provide roosting space for cavity or foliage-roosting bats, potential bat roost features shall be evaluated to determine if bats are present. Visual inspection and/or acoustic surveys shall be utilized as initial techniques. If no roosting bats are found, no additional measures are necessary. If roosting bats are found, the following shall be implemented: o The biologist shall develop and implement acceptable passive exclusion methods based on CDFW recommendations. If feasible, exclusion shall take place during the appropriate windows (September 15 and November 1) to avoid harming bat maternity roosts and/or winter hibernacula. (Authorization from CDFW is required to evict winter hibernacula for bats). o If established maternity colonies are found, in coordination with CDFW, a buffer shall be established around the colony to protect pre-volant young from construction disturbances until the young can fly; or implement other measures acceptable to CDFW. o If a tree is determined not to be an active roost site for roosting bats, it may be immediately limbed or removed as follows: If foliage roosting bats are determined to be present within the development areas or within 50 feet, limbs shall be lowered, inspected for bats by a bat biologist, and chipped immediately or moved to a dump site. Alternately, limbs may be lowered and left on the ground until the following day, when they can be chipped or moved to a dump site. No logs or tree sections shall be dropped on downed limbs or limb piles that have not been in place since the previous day. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) and lot development, if these activities are scheduled to occur within the bat reproductive season described above, the Applicant shall submit the results of site surveys characterizing special-status bat utilization within the project site to the HCD – Planning Services. If the results of the bat habitat characterizations surveys determine that an active special-status bat roost is present within the project site, the Applicant shall also submit the results of pre-construction bat surveys, conducted in accordance with this mitigation, and any recommended exclusion techniques to the HCD – Planning Services for review and approval. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-3	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of pallid bat, Townsend's big-eared bat, Monterey dusky-footed woodrat, and mountain lion, if present within the Project site, and in disturbance and loss of habitat.	Potentially Significant	**BIO-3b:** No more than seven days prior to construction activities for subdivision improvements (including vegetation removal) and lot development, a qualified biologist will conduct pre-construction surveys for MDFW nests within the development areas and in a buffer zone 25 feet out from the development areas, where feasible. If no MDFW nests are found, no additional measures are necessary. All nests within 25 feet of the development areas shall be flagged for avoidance and protected during project activities to the greatest extent feasible. Nests that cannot be avoided shall be manually deconstructed by a qualified biologist prior to land clearing activities to allow animals to escape harm. To the extent feasible, dismantling shall occur outside of the typical breeding season. If a litter of young is found or suspected, nest material shall be replaced, and the nest shall be left in place. A qualified biologist shall check on the nest to determine if the young are capable of independent survival before proceeding with nest dismantling. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) and lot development, the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct pre-construction surveys for MDFW. Within one week of the commencement of these activities, the Applicant shall submit the results of pre-construction surveys to HCD – Planning Services for review and shall identify in the submittal if any MDFW nests were manually deconstructed. The Applicant shall submit monthly monitoring reports during construction to the HCD – Planning Services documenting that protective fencing or flagging is intact in accordance with the Exclusionary Fencing Plan outlined in **Mitigation Measure BIO-1b**. The monitoring reports may be combined with the monthly monitoring reports required by **Mitigation Measure BIO-1e**. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.	Less than Significant
4.3 Biological Resources	BIO-4	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of California tiger salamander, California red-legged frog, Coast Range newt, California legless lizard, and coast horned lizard, if present within the Project site, and in disturbance and loss of habitat.	Potentially Significant	**Please see Mitigation Measures BIO-1a through BIO-1b, above.**	Less than Significant
4.3 Biological Resources	BIO-4	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of California tiger salamander, California red-legged frog, Coast Range newt, California legless lizard, and coast horned lizard, if present within the Project site, and in disturbance and loss of habitat.	Potentially Significant	**BIO-4a:** The Applicant shall comply with the ESA and CESA and contact the agencies to solicit concurrence that the project (including subdivision improvements and lot development) will not result in take or to acquire take authorization. Take authorization may require the Applicant to retain a qualified biologist to prepare a mitigation plan, which will include, but is not limited to, identifying avoidance and minimization measures, a mitigation strategy, and funding assurances. The Applicant will be required to implement the approved plan and any additional permit requirements. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation and rough grading of proposed building/septic envelopes), the Applicant shall submit to the HCD – Planning Services evidence from the USFWS and CDFW of concurrence that the project (including subdivision improvements and lot development) will not result in take or issuance of take authorization. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-4	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of California tiger salamander, California red-legged frog, Coast Range newt, California legless lizard, and coast horned lizard, if present within the Project site, and in disturbance and loss of habitat.	Potentially Significant	**BIO-4b:** A qualified biologist shall survey the work area and immediately adjacent areas 48 hours before and the morning of the onset of vegetation removal, demolition activities, and/or ground-disturbing activities (associated with both subdivision improvements and lot development) for the presence of CTS, CRLF, Coast Range newt, California legless lizard, and/or coast horned lizard. If a Coast Range newt, California legless lizard, or coast horned lizard are identified within the project site, a qualified biologist shall relocate the animal to an area that offers suitable habitat at least 100 feet from the work area. If any life stage of CTS or CRLF is observed and take authorization has been acquired, relocation measures, as defined in applicable permits, shall be followed. If any life stage of CTS or CRLF is observed and take authorization has not been acquired, vegetation removal, grading and/or construction activities shall not commence until the Service and/or CDFW are consulted, and appropriate actions are taken to allow project activities to begin. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct pre-construction surveys for CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard. Within one week of the commencement of these activities, the Applicant shall submit the results of pre-construction surveys, including any consultation with the Service and/or CDFW, to HCD – Planning Services for review. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.	Less than Significant
4.3 Biological Resources	BIO-4	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of California tiger salamander, California red-legged frog, Coast Range newt, California legless lizard, and coast horned lizard, if present within the Project site, and in disturbance and loss of habitat.	Potentially Significant	**BIO-4c:** During demolition, ground disturbing activities, and vegetation removal for the construction of subdivision improvements and lot development, a qualified biologist shall survey appropriate areas of the construction site daily before the onset of work activities for the presence of CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard. The qualified biologist shall remain on site until all initial ground disturbing activities (for both subdivision improvements and lot development) are completed. If a Coast Range newt, California legless lizard, or coast horned lizard is identified within the project site, a qualified biologist shall relocate the animal to an area that offers suitable habitat at least 100 feet from the work area. If any life stage of CTS or CRLF is observed and take authorization has been acquired, relocation measures as defined in applicable permits shall be followed. If any life stage of CTS and/or CRLF is found and these individuals are likely to be killed or injured by work activities and take authorization has not been acquired, work shall stop and the Service and/or CDFW shall be contacted. Work activities shall not resume until the Service and/or CDFW is consulted and appropriate actions are taken to allow project activities to continue. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct construction-phase surveys and monitoring for CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard. The Applicant shall submit monthly monitoring reports during demolition, vegetation removal, and initial ground-disturbing activities (for both the subdivision improvements and lot development) to the HCD – Planning Services documenting the results of daily CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard surveys and any consultation with the Service and/or CDFW. The monitoring reports may be combined with the monthly monitoring reports required by **Mitigation Measure BIO-1e**. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-4	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of California tiger salamander, California red-legged frog, Coast Range newt, California legless lizard, and coast horned lizard, if present within the Project site, and in disturbance and loss of habitat.	Potentially Significant	**BIO-4d:** After demolition, vegetation removal, and initial ground disturbing activities for the subdivision improvements and lot development are complete, or earlier if determined appropriate by the qualified biologist, the qualified biologist shall designate a construction monitor (a member of the construction crew) to oversee on-site compliance with all avoidance and minimization measures. The qualified biologist shall ensure that this construction monitor receives sufficient training in the identification of CTS, CRLF, Coast Range newt California legless lizard, and coast horned lizard. Thereafter the qualified biologist shall monitor the site at least weekly for the duration of ground-disturbing activities, then at least monthly following ground-disturbing activities to ensure compliance with all protective measures. The construction monitor and the qualified biologist shall be authorized to stop work if the avoidance and/or minimization measures are not being followed. If work is stopped due to the presence of CTS and/or CRLF and take authorization has not been acquired, the Service and/or CDFW shall be notified, and activities will not resume until the Service and/or CDFW are consulted and appropriate actions are taken to allow project activities to continue. Within one week of the qualified biologist designating a construction monitor to oversee on-site environmental compliance, the Applicant shall submit evidence to the HCD – Planning Services documenting that the construction monitor was sufficiently trained in the identification of CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard and the avoidance and minimization measures that are applicable to these species. The Applicant shall submit monthly monitoring reports during construction to the HCD – Planning Services documenting the results of daily CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard monitoring, and any consultation with the Service and/or CDFW. The monitoring reports may be combined with the monthly monitoring reports required by **Mitigation Measure BIO-1e**. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision	Less than Significant
4.3 Biological Resources	BIO-5	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of raptors and other nesting birds, including, but not limited to, the special-status white-tailed kite and loggerhead shrike.	Potentially Significant	**Please see Mitigation Measures BIO-1a through BIO-1e, above.**	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-5	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of raptors and other nesting birds, including, but not limited to, the special-status white-tailed kite and loggerhead shrike.	Potentially Significant	**BIO-5a:** To avoid impacts to nesting birds, vegetation removal, demolition activities, and construction shall commence prior to the nesting season (February 1 through September 15). If this is not possible, a pre-construction survey for nesting birds shall be conducted by a qualified biologist within 15 days prior to the commencement of these activities in all areas that may provide suitable nesting habitat within 300 feet of the project boundary. If nesting birds are identified during the pre-construction survey, an appropriate buffer, as identified by the qualified biologist, shall be imposed within which no construction activities or disturbance will take place, in accordance with the Exclusionary Fencing Plan prepared as part of **Mitigation Measure BIO-1b**. A qualified biologist shall be on-site during work re-initiation in the vicinity of the nest offset to ensure that the buffer is adequate and that the nest is not stressed and/or abandoned. No work shall proceed in the vicinity of an active nest until such time as all young are fledged, or until after September 15 (when young are assumed fledged). If construction is halted for more than two weeks during the nesting season, a qualified biologist shall re-survey the project site prior to reinitiation of construction. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) and lot development, if construction is scheduled to occur within the nesting bird season described above, the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct pre-construction surveys for nesting birds. Within one week of the commencement of construction, or reinitiation of construction delayed for two weeks or more during the nesting season, the Applicant shall submit the results of pre-construction surveys, if applicable, to HCD – Planning Services for review. The Applicant shall identify in the submittal if any nesting birds were identified and if any no disturbance buffer was imposed in accordance with the Exclusionary Fencing Plan prepared as part of **Mitigation Measure BIO-1b**. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.	Less than Significant
4.3 Biological Resources	BIO-6	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of Crotch's Bumble Bee and Western Bumble Bee, and in disturbance and loss of habitat, if present within the project site.	Potentially Significant	**Please see Mitigation Measures BIO-1a through BIO-1e, above.**	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-6	The Proposed Project would require grading, excavation, and other activities that may result in: 1) mortality or disturbance of Crotch's Bumble Bee and Western Bumble Bee, if present within the Project site; and, 2) disturbance and loss of Crotch's Bumble Bee and Western Bumble Bee habitat.	Potentially Significant	**BIO-6a:** A qualified biologist shall conduct surveys for CBB and WBB individuals and active colonies in accordance with CDFW's *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* or the most current CDFW survey guidelines. The surveys shall be conducted within areas of appropriate habitat (foraging, nesting, and overwintering) that will be impacted by the Proposed Project and, where feasible, an approximate 50-foot buffer of those areas. Surveys shall occur during the CBB and WBB life cycle when floral resources are present (ideally during peak bloom), on sunny days with wind speeds below eight miles per hour, and at least two hours after sunrise and three hours before sunset. The surveys shall be conducted no more than two years prior to initiation of construction. If no CBB individuals or active colonies (or suspected CBB or WBB that cannot be identified) are observed during the surveys, then no additional mitigation is necessary. If CBB or WBB individuals or active colonies (or suspected CBB or WBB that cannot be identified) are observed, the Applicant shall comply with CESA and contact CDFW to solicit concurrence that the Proposed Project will not result in take or to acquire take authorization in accordance with **Mitigation Measure BIO-4a**. Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct surveys for CBB and WBB. The Applicant shall submit a survey report to the HCD – Planning Services documenting the results of CBB and WBB surveys and any consultation with CDFW, as outlined in **Mitigation Measure BIO-4a**. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.	Less than Significant
4.3 Biological Resources	BIO-7	The Proposed Project would require grading, excavation, and other activities that may result in a permanent loss or disturbance of sensitive maritime chaparral habitat.	Potentially Significant	Please see Mitigation Measures **BIO-1a through BIO-1e, BIO-2b through BIO-2c, above.**	Less than Significant
4.3 Biological Resources	BIO-7	The Proposed Project would require grading, excavation, and other activities that may result in a permanent loss or disturbance of sensitive maritime chaparral habitat.	Potentially Significant	**BIO-7a:** Prior to recordation of the final map, a qualified biologist shall conduct habitat surveys of the project site to map the current extent of sensitive maritime chaparral habitat. The results of the survey shall be documented in a survey report. Avoidance of maritime chaparral habitat shall be implemented, as outlined in **Mitigation Measure BIO-1a, BIO-1b**, and **BIO-2d**. For maritime chaparral habitat that cannot be avoided, **Mitigation Measure BIO-2c** shall be implemented. Prior to the recordation of the final map), the Applicant shall submit to the HCD – Planning Services for review and approval the results of a habitat survey that includes mapping of sensitive maritime chaparral habitat.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-9	The Proposed Project would require the removal of native trees (coast live oaks) and non-native trees (Monterey pine) within the development areas. Construction activities may result in impacts to trees not planned for removal.	Potentially Significant	**BIO-9a:** Avoidance of oak woodland and individual oak trees should be considered during the design stage for all aspects of the project in order to retain the healthy contiguous stands of the oak woodland resources within the project site. Prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall retain a certified Arborist or Forester to prepare a Final FMP that identifies trees within the development areas, inventories trees necessary for removal, and outlines necessary components of the Tree Replacement Plan, as identified in **Mitigation Measure BIO-9b**, to ensure the long-term overall health of the forest. The Final FMP shall include, but not be limited to, the relevant BMPs for work near trees identified in the Staub 2006 FMP (**Appendix D**) or as updated in the DD&A 2021 FMP (**Appendix E**). A note shall be placed on the construction drawings identifying the site-specific BMPs. Prior to the recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall retain a certified Arborist or Forester to prepare a Final FMP to determine site-specific recommendations and requirements. These recommendations may include, but are not limited to, utilization of existing trees, minimization of impacts to existing oaks, installation of screening trees, avoidance of landmark sized trees, avoidance of slopes greater than 30%, and analyzing impacts to soil from erosion. The Final FMP shall be submitted to the HCD – Planning Services for review and approval. Prior to the issuance of a use permit to remove native coast live oak trees, demolition permit, grading permit, or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit evidence to the HCD – Planning Services that the applicable measures in the Final FMP have been added to the construction plans.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.3 Biological Resources	BIO-9	The Proposed Project would require the removal of native trees (coast live oaks) and non-native trees (Monterey pine) within the development areas. Construction activities may result in impacts to trees not planned for removal.	Potentially Significant	**BIO-9b:** Where tree avoidance is not feasible, tree replacement shall be implemented. All coast live oak and Monterey pine trees 6 inches or larger shall be replaced on a 1:1 basis by planting or transplanting trees in areas of suitable soil as determined appropriate by a qualified professional forester, arborist, or horticulturist. A Tree Replacement Plan shall be prepared by a qualified professional forester, arborist, or horticulturist prior to recordation of the final map. The plan shall be subject to review and approval by the HCD – Planning Services and will include the following: ▪ Identify tree planting areas with suitable soils that will also fulfill project landscape plans and visual screening objectives, as feasible. ▪ Identify monitoring requirements, such as a site inspection at the end of the first winter after planting to confirm numbers, species of replacement, and locations of plantings. Annual inspections over five years shall confirm the objective of the plan, such as the survivability of the plantings, and the percentage of healthy trees. ▪ At least 70 percent of the plantings shall be established/surviving by five years or monitoring (and replacement) shall continue until compliance is achieved. ▪ The location and species of all required replacement trees planted shall be mapped so they can be monitored for over the five-year period. The monitoring period shall be extended for individual trees that die or are in poor health and must be replaced. ▪ Transplanting of onsite native seedlings within construction areas and protection of those occurring near construction areas to maintain natural diversity and adaptation. ▪ All replacement trees shall be of local genetic stock. ▪ Replanting should avoid open spaces where currently there are no trees unless there is evidence of soil deep enough and of good enough quality to support the plantings. ▪ Most replacement shall be of a small size (cell or one gallon) as studies have shown that small trees more readily adapt to a site and grow larger over the mid-to long-term. ▪ Provide an adaptive management scenario if the success criteria are not being met. ▪ Require that tree removal of native oaks and pines 6 inches or larger for future lot construction be subject to County approval and appropriate tree replacement. Prior to the recordation of the final map or implementation of subdivision improvements (including vegetation removal) the Applicant shall submit to the HCD – Planning Services a Tree Replacement Plan prepared by a qualified professional forester, arborist, or horticulturalist for review and approval and evidence that final map includes a note requiring implementation of the Tree Replacement Plan described in the mitigation above.	Less than Significant
4.3 Biological Resources	BIO-9	The Proposed Project would require the removal of native trees (coast live oaks) and non-native trees (Monterey pine) within the development areas. Construction activities may result in impacts to trees not planned for removal.	Potentially Significant	**BIO-9c:** To ensure that impacts to trees which are not proposed for removal are avoided or minimized to the greatest extent feasible, the best management practices ("BMPs") for work near trees identified in the Final FMP (prepared in accordance with **Mitigation Measure BIO-9a**) shall be implemented during construction. A note shall be placed on the construction drawings identifying these BMPs. A qualified biologist or arborist shall monitor all vegetation removal, demolition activities, and ground disturbing activities for the construction of subdivision improvements and lot development, and then conduct weekly monitoring throughout the duration of construction to ensure that the BMPs are implemented. Prior to the issuance of a grading permit for the construction of subdivision improvements or lot development, the Applicant shall submit evidence to the HCD – Planning Services that the BMPs have been added to the construction plans and that a qualified biologist or arborist has been retained to monitor the project throughout the duration of construction. The Applicant shall submit monthly report during construction to the HCD – Planning Services documenting adherence to the BMPs. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.4 Cultural and Tribal Resources	CR-2	Construction of the Project may result in the discovery and disturbance of unknown archaeological resources, and/or tribal cultural resources.	Potentially Significant	**CR-2a:** Prior to the issuance of any grading or building permits, the Applicant shall submit evidence (i.e., a contract) demonstrating that the Applicant has retained a qualified archaeologist to monitor ground disturbing activities. To minimize potential impacts to previously unknown or subsurface historical or archaeological resources, a qualified archaeologist shall monitor all major ground-disturbing activities associated with the construction of subdivision improvements and grading of proposed building envelopes. All work shall stop if a cultural resource is discovered during construction. If archaeological resources or human remains are discovered during any construction, work shall be halted within 50 meters (±160 feet) of the find until it can be evaluated by a qualified professional archaeologist. If the find is determined to be significant, appropriate mitigation measures shall be formulated and implemented, with the concurrence of the Lead Agency. The County Coroner shall be notified in accordance with provisions of Public Resources Code 5097.98-99 in the event human remains are found and the Native American Heritage Commission shall be notified in accordance with the provisions of Public Resources Code section 5097 if the remains are determined to be of Native American origin. The Applicant shall submit a signed contract with the qualified professional archaeologist incorporating the requirement of this mitigation to the HCD – Planning Services for review and approval. The applicant shall also submit on-going monitoring reports from the archaeologist to HCD – Planning Services in accordance with the contract requirements.	Less than Significant
4.4 Cultural and Tribal Resources	CR-3	The Proposed Project could potentially affect human remains, including those interred outside of formal cemeteries.	Potentially Significant	Please see **Mitigation Measure CR-2a**, above.	Less than Significant
4.4 Cultural and Tribal Resources	CR-4	The Proposed Project would result in ground disturbing activities. As a result, the Proposed Project could potentially affect a tribal cultural resource, defined in Public Resource Code section 21074 and that is listed or eligible for listing in the California Register of Historical Resources, or a local register of historical resources defined in Public Resources Code section 5020.1(k) and 5024.1(c).	Potentially Significant	Please see **Mitigation Measure CR-2a**, above.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.6 Geology and Soils	GS-1	Seismic ground shaking at the Project site may occur during the next major earthquake on a regional fault system. Such shaking can cause severe damage to or collapse of building or other Project facilities and may expose people to injury or death. The Project site is in a seismically active region and could expose people and structures to potential adverse effects.	Potentially Significant	**GS-1:** Prior to the issuance of any grading or building permit, the Applicant shall submit a design-level geotechnical report that is consistent with the most current version of the California Building Code in effect at the time of building permit issuance. The design-level geotechnical report shall consider previous recommendations contained in the Preliminary Geologic and Geotechnical Report prepared by HKA (2004) and shall provide additional site-specific recommendations, where appropriate. The project-specific geotechnical analysis shall be performed by a registered professional engineer with geotechnical expertise, and all recommendations incorporated into final design plans, subject to review of the County of Monterey – HCD Planning. The requirements of this mitigation measure shall be included as a "Note" on the final map and shall also be included as a "Note" on all subdivision improvement plans.	Less than Significant
4.6 Geology and Soils	GS-2	Construction of the Project could result in substantial soil erosion or loss of topsoil. Extensive grading on the site to facilitate the Project-related infrastructure could result in substantial erosion or loss of topsoil.	Potentially Significant	**GS-2a:** Prior to the issuance of any grading permit for proposed subdivision improvements and grading of the proposed building envelopes, the Applicant shall submit an Erosion Control Plan and a Storm Water Pollution Prevention Plan ("SWPPP") prepared in accordance with Regional Water Quality Control Board standards to the County of Monterey for review. The Erosion Control Plan and SWPPP shall document best management practices to be implemented to ensure that contaminated runoff and sediment are minimized during site preparation, construction, and post-construction periods. The Erosion Control Plan and SWPPP shall incorporate best management practices consistent with the requirements of the National Pollutant Discharge Elimination System ("NPDES") and Monterey County Code section 16.12.80, Land Clearing. Prior to the issuance of any grading permit, the Applicant shall submit an Erosion Control Plan and a copy of the approved SWPPP, including the Waste Discharge Identification Number, to County of Monterey HCD – Environmental Services for review and approval. The requirements of this mitigation measure shall be included as a "Note" on the final map and shall also be included as a "Note" on all subdivision improvement plans.	Less than Significant
4.6 Geology and Soils	GS-2	Construction of the Project could result in substantial soil erosion or loss of topsoil. Extensive grading on the site to facilitate the Project-related infrastructure could result in substantial erosion or loss of topsoil.	Potentially Significant	**GS-2b:** Prior to the issuance of any grading and building permits for each residential lot and subdivision improvements, the Applicant shall submit a re-vegetation and landscaping plan prepared by a qualified landscape architect. All replanting shall consist of native and drought tolerant plants that shall be subject to the review and approval of County of Monterey HCD-Planning. The re-vegetation and landscaping plan shall indicate where areas disturbed by grading shall be stabilized with landscaping vegetative cover. This re-vegetative and landscaping plan is subject to the review and approval of the County of Monterey HCD-Planning. The requirements of this mitigation measure shall be included as a "Note" on the final map and shall also be included as a "Note" on all subdivision improvement plans.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.6 Geology and Soils	GS-3	The Proposed Project could result in potential geologic hazards due to soils that are unstable or could become unstable as a result of landslides, lateral spreading, expansive soils, liquefaction, and localized subsidence. While the Proposed Project would likely not result in on-or-off site landslides or induce lateral spreading, there is risk of subsidence, liquefication, and collapse in isolated areas.	Potentially Significant	Please see **Mitigation Measures GS-1, GS-2a**, and **GS-2b** above.	Less than Significant
4.6 Geology and Soils	GS-3	The Proposed Project could result in potential geologic hazards due to soils that are unstable or could become unstable as a result of landslides, lateral spreading, expansive soils, liquefaction, and localized subsidence. While the Proposed Project would likely not result in on-or-off site landslides or induce lateral spreading, there is risk of subsidence, liquefication, and collapse in isolated areas.	Potentially Significant	**GS-3:** Prior to issuance of any grading or building permit, the Applicant shall submit a site-specific/design-level Supplemental Liquefaction Investigation prepared in accordance with the California Department of Mines & Geology Special Publication 117. The Supplemental Liquefaction Investigation shall include in its analysis the approved drainage plan. Engineering measures to protect development in this area could include structural strengthening of buildings to resist predicted ground settlement, utilization of post tension or mat slab foundations or a combination of such measure as recommended in the Preliminary Geologic and Geotechnical Report prepared by HKA (2004). The requirements of this mitigation measure shall be included as a "Note" on the final map and shall also be included as a "Note" on all subdivision improvement plans.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.8 Hazards and Hazardous Materials	HZ-2	The Project could create a significant hazard to the public or the environment through the reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The Project site has historically been used for agricultural purposes, which could expose site occupants to residual hazards due to pesticide use. In addition, the Project also involves the demolition of existing on-site structures that could include lead-based paint and asbestos containing material. As a result, the Proposed Project could expose site occupants, including future residents and/or construction personnel, to a health risk.	Potentially Significant	**HZ-2a:** Prior to the issuance of any grading permit or building permit, the Applicant shall retain a qualified professional to conduct a Phase I Environmental Site Assessment in conformance with ASTM Standard 1527-05 for the portion of land to be graded. The Phase I shall identify potential locations where hazardous material contamination may be encountered on the site in connection with prior agricultural use. Where potential contamination is identified, the Environmental Site Assessment shall include site-specific soil sampling to assess the presence of potential soil contamination (pesticide residues). If an Environmental Site Assessment indicates that residual contamination or a release of hazardous materials could have affected soil or groundwater quality at a project site, a Phase II Environmental Site Assessment shall be conducted to determine the extent of contamination. The Phase II ESA shall identify recommended measures to address residential agricultural contamination, including but not limited to removal of contaminated soils. If the results of the subsurface investigation(s) indicate the presence of hazardous materials, the Applicant shall coordinate with the County of Monterey Environmental Health Bureau to develop and implement a program to remediate or manage the contaminated soil during construction. Disposal shall occur at an appropriate facility licensed to handle such contaminants and remedial excavation shall proceed under the supervision of an environmental consultant licensed to oversee such remediation. If the Phase II ESA determines that remediation is necessary, and more specifically if remediation is necessary in areas identified as biological sensitive as discussed in **Section 4.3 Biological Resources**, than the Applicant shall restore these areas to native habitat. The Applicant shall submit all correspondence and reports to the County of Monterey HCD – Planning and County of Monterey Environmental Health Bureau prior to issuance of grading permits. Upon completion of any required remediation and disposal, a qualified environmental consultant shall prepare and submit to the County for review and approval a report summarizing the remediation efforts, the remediation and disposal approach implemented, and the analytical results after completion of the remediation, including all waste disposal or treatment manifests.	Less than Significant
4.8 Hazards and Hazardous Materials	HZ-2	The Project could create a significant hazard to the public or the environment through the reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The Project site has historically been used for agricultural purposes, which could expose site occupants to residual hazards due to pesticide use. In addition, the Project also involves the demolition of existing on-site structures that could include lead-based paint and asbestos containing material. As a result, the Proposed Project could expose site occupants, including future residents and/or construction personnel, to a health risk.	Potentially Significant	**HZ-2b:** Prior to demolition of any on-site structure, the Applicant shall submit a lead assessment to the County of Monterey HCD – Planning , County of Monterey Environmental Health Bureau, and MBARD for review and approval. The assessment shall evaluate existing on-site structures for the presence of lead-based paint. If present, all lead-based paint shall be removed by a licensed abatement contractor and the Applicant shall submit a final report detailing that all lead-based paint was removed and properly disposed of in accordance with industry standards, including Title 22 of the California Code of Regulations. Similarly, the Applicant shall also submit an asbestos survey demonstrating that all existing on-site structures were evaluated for the presence of asbestos containing material prior to demolition. If asbestos containing material is present, the Applicant shall submit a final report detailing that all asbestos containing material was disposed of in accordance with industry standard.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.9 Hydrology and Water Quality	HYD-1	The Proposed Project could result in potential water quality effects associated with the construction and operation of the Proposed Project. As a result, the Proposed Project could violate applicable water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.	Potentially Significant	**HYD-1:** The Applicant shall prepare an ECP and a SWPPP, which includes the proper design and placement of sediment traps to prevent the discharge of sediments and pollutants into downstream waterways during construction. Good housekeeping, waste containment, minimization of disturbed areas, stabilization of disturbed areas, the protection of slopes and channels, the control of the site perimeter, and the control of internal erosion during construction are the objectives of the BMPs to be included in the ECP and SWPPP. Potential BMPs include but are not limited to limited soil exposure through scheduling and preserving existing vegetation; stabilizing soils through seeding, planting, mulching; diverting runoff through earth diking, temporary drains, swales, and slope drainage; reducing velocity through outlet protection, check dams, slope roughening/terracing; trapping and filtering sediment through silt fencing, straw bale barriers, and brush and rock filters, storm drain and inlet protection, and sediment basins. Prior to the issuance of a grading permit, the Applicant shall submit evidence of a General Construction Activity Storm Water Permit obtained from the Regional Water Board to the HCD – Planning Services for review and approval. Prior to the issuance of a grading permit, the Applicant shall submit a final drainage plan for review and approval to the HCD – Environmental Services for review and approval.	Less than Significant
4.9 Hydrology and Water Quality	HYD-2	The Proposed Project would substantially alter the existing drainage pattern of the site or area through the addition of impervious surfaces that could substantially increase the rate or amount of surface water runoff in a manner that could result in flooding on- or off-site. Moreover, increases in impervious surfaces could also result in additional sources of runoff that could exceed the capacity of planned stormwater drainage improvements.	Potentially Significant	**HYD-2:** Prior to the recordation of the final map, the Applicant shall submit design-level subdivision improvement plans and supporting drainage calculations demonstrating that the two (2) proposed detention-retention basins can accommodate the 100-year storm event, with engineered design features to control the release of detained flows so as to not exceed pre-development 10-year storm levels. The detention-retention basin at the Lot 16 location shall include measures to enhance percolation and recharge to the maximum extent practicable. Prior to the recordation of the final map, the project applicant shall submit a drainage plan to the PWFP and HCD-Environmental Services for review and approval.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.11 Noise and Vibration	NS-1	The Project would not expose persons to or generate noise levels in excess of standards established in the 1982 General Plan. The Proposed Project would result in temporary construction and operational noise. Noise generated by the Project, as mitigated, would not exceed any applicable noise standards set by the 1982 General Plan. Furthermore, temporary construction generated noise would be further minimized by standard best management practices ("BMPs").	Potentially Significant	**NS-1a:** Prior to issuance of any grading permit or building permit, the Applicant(s) shall submit final construction specifications and improvement plans to HCD – Planning Services for review and approval. The construction specifications and improvement plans shall identify the specific measures that will be implemented to reduce noise levels generated during construction. Applicable noise control measures include, but are not limited to, to following: ▪ Noise-generating activities at the construction site or in areas adjacent to the construction site shall be restricted to the hours of 8:00 a.m. to 5:00 p.m., Monday through Friday. No construction activities shall occur on weekends or holidays. ▪ All internal combustion engine driven equipment shall be equipped with intake and exhaust mufflers that are in good condition and appropriate for the equipment. ▪ Unnecessary idling of internal combustion engines shall be prohibited. ▪ Stationary noise generating equipment shall be located as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area. ▪ Quiet air compressors and other stationary noise sources shall be utilized where that technology exists. ▪ Radios shall be controlled as to not be audible outside of the project site.	Less than Significant
4.11 Noise and Vibration	NS-1	The Project would not expose persons to or generate noise levels in excess of standards established in the 1982 General Plan. The Proposed Project would result in temporary construction and operational noise. Noise generated by the Project, as mitigated, would not exceed any applicable noise standards set by the 1982 General Plan. Furthermore, temporary construction generated noise would be further minimized by standard best management practices ("BMPs").	Potentially Significant	**NS-1b:** Prior to issuance of a building or grading permit, the contractor shall prepare a Construction Management Plan identifying the schedule for major noise-generating construction activities. The Construction Management shall identify a procedure for coordination with the adjacent occupied dwellings within 2,500 feet of the Project site so that construction activities can be scheduled to minimize noise disturbance. The plan will also identify a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and shall require that reasonable measures be implemented to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site, and a notice shall be sent to neighbors regarding the construction schedule.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.13 Transportation	TR-1	The Proposed Project would increase the extent of residential development on-site as compared to existing, pre-project, conditions. This would result in an increase in daily traffic trips associated with new residential uses. VMT associated with the Proposed Project would exceed OPR's small project screening threshold. This represents a significant and unavoidable impact. Due to the rural nature of the Proposed Project, there are no feasible mitigation measures available to reduce this impact to a less than significant level.	Significant and Unavoidable	None	Significant and Unavoidable
4.14 Wastewater Disposal	WWD-1	The Proposed Project could have soils incapable of adequately supporting the use of onsite septic systems. However, Project site evaluation has determined adequate soil and site characteristics.	Potentially Significant	**WWD-1a:** Prior to the recordation of the final map, the Applicant shall submit a revised final map to the HCD-Planning and County of Monterey – EHB, that merges lots 2, 7, and 16 with adjacent lots having suitable soils. In this configuration the merged lot could be identified as "existing," which would allow the use of an alternative OWTS to mitigate rapid (<1 MPI) percolation rates found on these three lots. Alternatively, the Applicant may submit a revised final map that identifies alternative leachfield areas with suitable site soils for on-site wastewater disposal. In this instance, the Applicant shall submit supporting soil samples and engineering analysis demonstrating that site soils can support on-site septic disposal. The Applicant shall be responsible for reimbursing County of Monterey for any costs incurred with the review of alternative leachfield areas	Less than Significant
4.14 Wastewater Disposal	WWD-1	The Proposed Project could have soils incapable of adequately supporting the use of onsite septic systems. However, Project site evaluation has determined adequate soil and site characteristics.	Potentially Significant	**WWD-1b:** Prior to the recordation of the final map, the Applicant shall submit a revised final map that either: a) merges lots 8 and 10 with adjacent lots; b) increases the horizontal separation distance between adjacent septic envelopes to a minimum of 50 feet; or (c) completion (by the Applicant) of a cumulative impact analysis addressing the potential for groundwater mounding effects between the closely spaced leachfields for proposed for Lots 4, 8, 9 and 10. The cumulative impact analysis shall be developed in consultation with EHB and shall be prepared by a qualified professional with experience in onsite wastewater analysis. The analysis shall include, but is not limited to, the following: 1) circumstances requiring cumulative impact assessment; 2) minimum qualifications of individuals performing the work; 3) data needs and assumptions; 4) analytical methods and calculations; 5) evaluation methods and criteria; 6) recommendations and/or mitigations; and, 7) provision for inclusion of specific requirements or recommendations of the California Regional Water Quality Board having jurisdiction. The analysis should consider such factors as drainage and shallow seasonal groundwater conditions, presence of restrictive soil layers, estimated rates of lateral groundwater movement, and separation distances between adjacent leachfields. The Applicant shall submit the cumulative impact analysis to EHB for review and approval prior to the recordation of the final map.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.15 Water Supply	WS-1	The Proposed Project could potentially deplete ground supplies or interfere with groundwater recharge due to increased water demand associated with the Proposed Project. This could potentially result in a net deficit in aquifer volume or a lowering of the local groundwater table level.	Potentially Significant	**WS-1:** Prior to recordation of the final map, the Applicant shall submit a Water Use Plan demonstrating that proposed water demand for the subdivision shall not exceed 10.64 acre-feet per year. The Water Use Plan shall assign proposed water demand for each lot; future residential use of each lot shall not exceed the assigned water demand for that lot. The Water Use Plan shall also identify annual reporting requirements and enforcement measures (e.g., warnings, penalties, etc.) to ensure that actual water use does not exceed the amount assigned for each lot. The Applicant shall record a deed restriction on each lot notifying future owners that water use on the property shall be fixed to the amount established in the approved Water Use Plan. The Water Use Plan shall be submitted to HCD – Planning, Water Resources Agency, and EHB for review and approval prior to recordation of the final map. In addition, the proposed deed restriction shall also be submitted to the County for review and approval prior to final map recordation. Prior to recordation of the final map, the Applicant shall include **Mitigation Measure WS-1** as notes on the final map. Concurrent with the sale of any lot, the Applicant shall fix the maximum permitted water use on that individual lot within the total water use allowed under the approved Water Use Plan, and the Applicant shall record a notice on title fixing the maximum permitted water use for that lot. The notice shall be signed by both the buyer and the seller. The Applicant shall provide a copy of the recorded notice to the County, and no building permits shall be issued on the lot until the County has received a copy of the recorded notice. Prior to the issuance of any future grading and/or building permits for development of each individual lot, the Applicant shall submit a water demand report to the HCD – Planning demonstrating that future residential use, including both interior and exterior water use, of the site would not exceed the amount established for that particular lot in the approved Water Use Plan.	Less than Significant
4.15 Water Supply	WS-1	The Proposed Project could potentially deplete ground supplies or interfere with groundwater recharge due to increased water demand associated with the Proposed Project. This could potentially result in a net deficit in aquifer volume or a lowering of the local groundwater table level.	Potentially Significant	**WS-2:** Prior to the recordation of the final map, the Applicant shall record a deed restriction that requires the use of water conservation measures as part of all new plumbing fixtures and exterior landscaping. Specifically, the deed restriction shall require the use of low-flow plumbing fixtures in all new residences and the use of native, drought-tolerant landscaping and drip irrigation for all exterior landscaping. The deed restriction shall also prohibit water-intensive uses, including but not limited to vineyards, ornamental fountains that do not recirculate water, and washing of hard surfaces such as streets, gutters, sidewalks, and driveways in any portion of the proposed lots. The Applicant shall submit the deed restriction to the County of Monterey HCD – Planning and the Water Resources Agency for review and approval prior to the recordation of the final map. Prior to recordation of the final map, the Applicant shall include **Mitigation Measure WS-2** as notes on the final map.	Less than Significant
4.15 Water Supply	WS-1	The Proposed Project could potentially deplete ground supplies or interfere with groundwater recharge due to increased water demand associated with the Proposed Project. This could potentially result in a net deficit in aquifer volume or a lowering of the local groundwater table level.	Potentially Significant	**WS-3:** Prior to the issuance of any building permit for each residence, the Applicant shall submit a landscape design package that includes the use of drought-tolerant landscaping, as well as the use of drip irrigation. The landscape design package shall include a water-efficient landscape sheet, soil management report, landscape design plan, irrigation design plan, and grading design plan. The package shall demonstrate compliance with the substantive requirements of the Department of Water Resources' Model Water Efficient Landscape Ordinance, Title 23, California Code of Regulations, Sections 490-495, or any subsequent water conservation ordinance adopted by the County for the same purpose that is in effect at the time of building permit issuance. The final map and each site plan shall indicate that submittal and approval of the landscape documentation package for each lot is necessary for development of the lot prior to issuance of any building permit. The County of Monterey HCD – Planning shall review and approve the landscape design package prior to the issuance of each building permit.	Less than Significant

Section	Impact	Summary	Significance	Mitigation Measure	Residual Impact
4.15 Water Supply	WS-1	The Proposed Project could potentially deplete ground supplies or interfere with groundwater recharge due to increased water demand associated with the Proposed Project. This could potentially result in a net deficit in aquifer volume or a lowering of the local groundwater table level.	Potentially Significant	**WS-4:** Prior to the recordation of the final map, the Applicant shall submit detailed design-level plans and supporting technical documentation for the proposed retention-detention facilities demonstrating that the on-site facilities can achieve a minimum 50% recharge rate. A registered civil engineer shall prepare the design-level plans and the design-level plans shall be accompanied by a hydrologic report certifying that the proposed detention-retention facilities are designed to achieve a minimum 50% recharge. The detention-retention facilities shall be sized to maximize the retention and recharge of rainfall on-site. The Applicant shall submit the design-level plans and supporting technical documentation for the retention-detention facilities to HCD – Environmental Services for review and approval. Prior to approval of subdivision improvement plans, the Applicant shall include the approved design-level plans and supporting technical documentation for the retention-detention facilities within the subdivision improvement plans.	Less than Significant
4.15 Water Supply	WS-1	The Proposed Project could potentially deplete ground supplies or interfere with groundwater recharge due to increased water demand associated with the Proposed Project. This could potentially result in a net deficit in aquifer volume or a lowering of the local groundwater table level.	Potentially Significant	**WS-5:** Prior to the recordation of the final map, the Applicant shall prepare an Operations and Maintenance Plan for ongoing inspection, monitoring, and maintenance of on-site drainage facilities, including all measures used for infiltration and water quality control. The maintenance plan shall include, but not limited to, the following: ▪ Maintenance schedule, including frequency, and responsible party (or parties); ▪ Proof of funding sources for ongoing maintenance; ▪ Reporting schedule (at least annually); ▪ Inspection of facilities following any major storm event and removal of accumulated sediments; and ▪ Weekly inspection of the facilities while the Project is under construction and during the rainy season (October through April). The Operations and Maintenance Plan shall be submitted for review and approval by the HCD-Environmental Services and Monterey County Water Resources Agency.	Less than Significant
4.15 Water Supply	WS-2	The Proposed Project would require the expansion of existing water distribution facilities, the construction of which could cause significant environmental effects.	Potentially Significant	Please see **Mitigation Measures BIO-1a – BIO-1e, BIO-2a – BIO-2c, BIO-3a – BIO-3b, BIO-4a – BIO-4c, BIO-5a, BIO-6a, BIO-7a, BIO-9a – BIO-9c, CR-2a, GS-1, GS-2a – GS-2b, GS-3, HZ-2a – HZ-2b, HYD-1,** and **HYD,** above**.**	Less than Significant
4.15 Water Supply	WS-3	The Proposed Project would increase the demand for water supply on the existing WHMWC. This could potentially constitute a significant impact if: a) new or expanded facilities are necessary to serve the Proposed Project or b) there would be a lack of a long-term sustainable water supply to serve the Proposed Project. While there is an adequate long-term sustainable water supply to serve the Proposed Project, additional facilities would be necessary to ensure that the WHMWC can serve the Proposed Project, as well as existing connections.	Potentially Significant	**WS-6:** Prior to the recordation of the final map, the Project Applicant shall install (or bond) the standby well. The well shall have sufficient capacity to serve the Proposed Project and existing connections currently served by the Woodland Heights Mutual Water Company. The well shall be installed to the satisfaction of the County of Monterey Environmental Health Bureau.	Less than Significant

2.6 AREAS OF KNOWN CONTROVERSY

CEQA Guidelines Sec. 15123 states that an EIR shall identify areas of controversy known to the Lead Agency. Based on comment letters received during the NOP public review period and comments provided during the scoping meeting, the following environmental issues are known to be of concern and may be controversial (each issue will be further discussed in the EIR):

- Impacts to air quality as it relates to construction source emissions, traffic emissions, and consistency with the *Air Quality Management Plan*;
- Impacts to special status flora and fauna species and habitat within the Project site;
- Impacts of project-specific and cumulative traffic along U.S. 101 and Pesante Road; and
- Potential secondary effects associated with the Proposed Project.

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Chapter 3 PROJECT DESCRIPTION

3.1 INTRODUCTION

This chapter presents the description of the proposed LaTourette Subdivision ("Proposed Project" or "Project") pursuant to CEQA Guidelines Section 15124. This chapter includes a description of the project location (CEQA Guidelines Sec. 15124(a)), including associated exhibits, a statement of objectives (CEQA Guidelines Sec. 15124(b)), a description of the project's relevant characteristics (CEQA Sec. 15124(c)). The County of Monterey ("County") is the Lead Agency for the purposes of this project (CEQA Guidelines Secs. 15050-15051) and is responsible for preparing the EIR (CEQA Guidelines Sec. 15120 through Sec. 15132).

The Proposed Project consists of the development of the LaTourette Subdivision, a 19-lot low-density residential subdivision located in the unincorporated area of northern Monterey County. The Proposed Project consists of a standard subdivision Vesting Tentative Map for the division of a 47.57-acre parcel into 19 residential lots ranging in size from ranging in size from 1.17 to 5.3 acres with an average size of 2.4 acres. The Project also involves the expansion of the existing Woodland Heights Mutual Water System and construction of project infrastructure, including roads, water and utility lines, and drainage facilities. The Proposed Project consists of 1) Standard Subdivision Vesting Tentative Map; 2) Use Permit for expansion of the Woodland Heights Mutual Water System to provide 19 additional water connections necessary for the proposed lots; and 3) Use Permit for removal of protected trees.

The following contains a detailed description of the Project location, historical background, relevant Project characteristics, goals, and objectives, and intended use of this EIR. A detailed description of the Project characteristics is provided below.

3.2 PROJECT LOCATION

3.2.1 REGIONAL LOCATION & VICINITY

The Proposed Project is in northern Monterey County in the unincorporated area known as Prunedale. The Project site is approximately 10 miles north of Salinas and 25 miles northeast of Monterey (refer to **Figure 3-1**). Regional access to the site is provided from State Route 101 via Pesante Road and King Road. Please see **Section 4.13, Transportation** of this EIR for more information concerning site access and regional roadway network.

3.2.2 PROJECT SITE

The Project site is located at 19945 Pesante Road, north of the Pesante Road/King Road intersection. The site is approximately two (2) miles east of State Route 101 and is immediately adjacent to the existing Woodland Heights Subdivision (refer to **Figure 3-2**). The Assessor's Parcel Number for the site is 125-101-016-000. The site is approximately 47.57- acres and is zoned Low Density Residential (2.5 acres/unit).



Regional Map

Date
6/29/2022

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Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure
3-1

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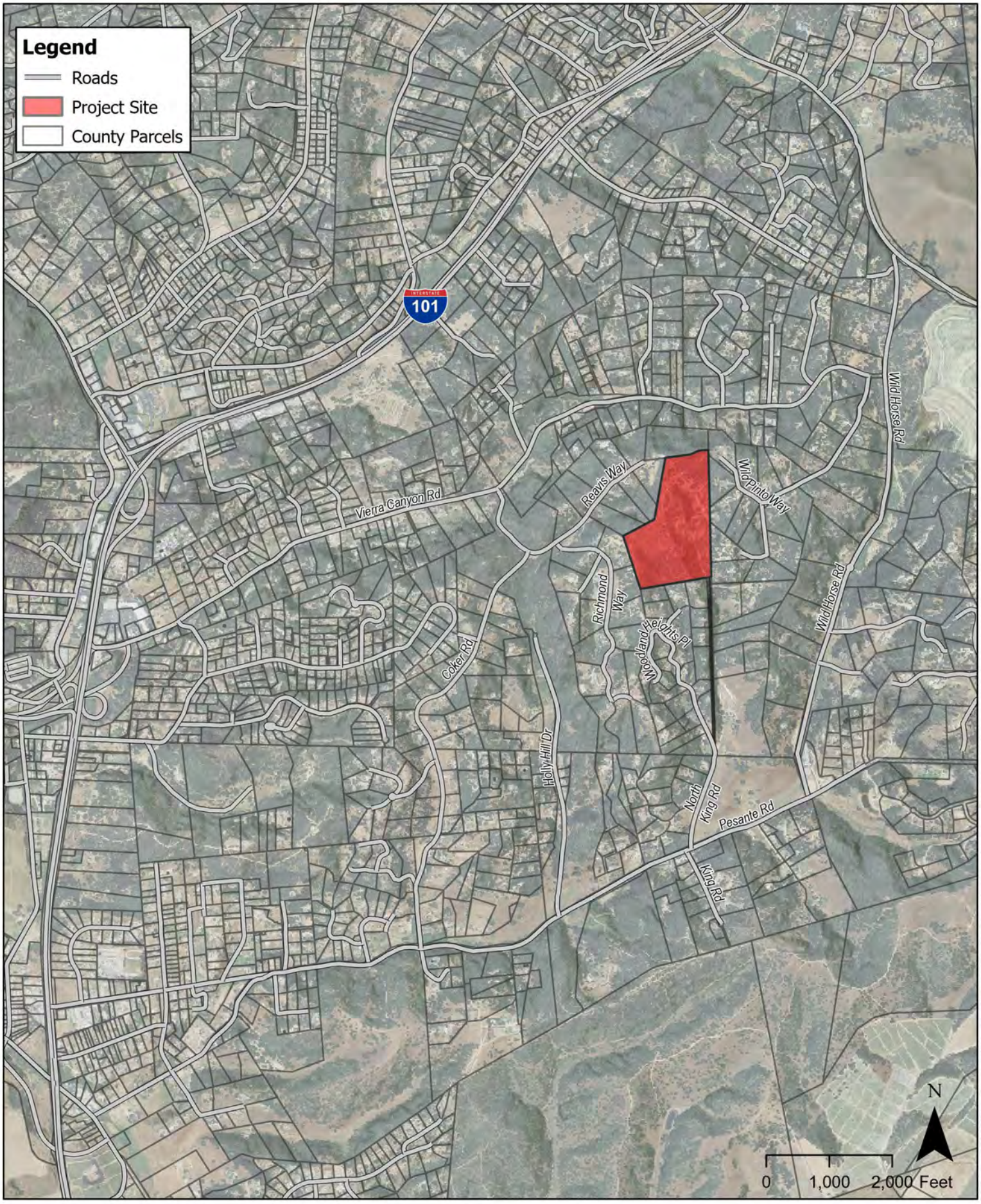

Vicinity Map

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6/28/2022

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Planning and Environmental Consulting

Figure
3-2

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The site is comprised mainly of rolling hills supporting some grazing and rural residential development. Vegetation in the area includes a combination of oak woodland, coast range grassland, and maritime chaparral. The Project site is primarily undeveloped; however, it currently includes three (3) single-family residences (mobile homes), water tanks, agricultural improvements, and related support structures. In addition, the site is also improved with limited infrastructure improvements (i.e., on-site wells, septic systems, and utilities) to serve existing uses. Access to the existing on-site uses is provided via an existing dirt road. The internal dirt road connects the site with the existing Woodland Heights Subdivision. This road would be updated and realigned to provide access to the proposed new residential lots, see **Figure 3-3, Vesting Tentative Map.**

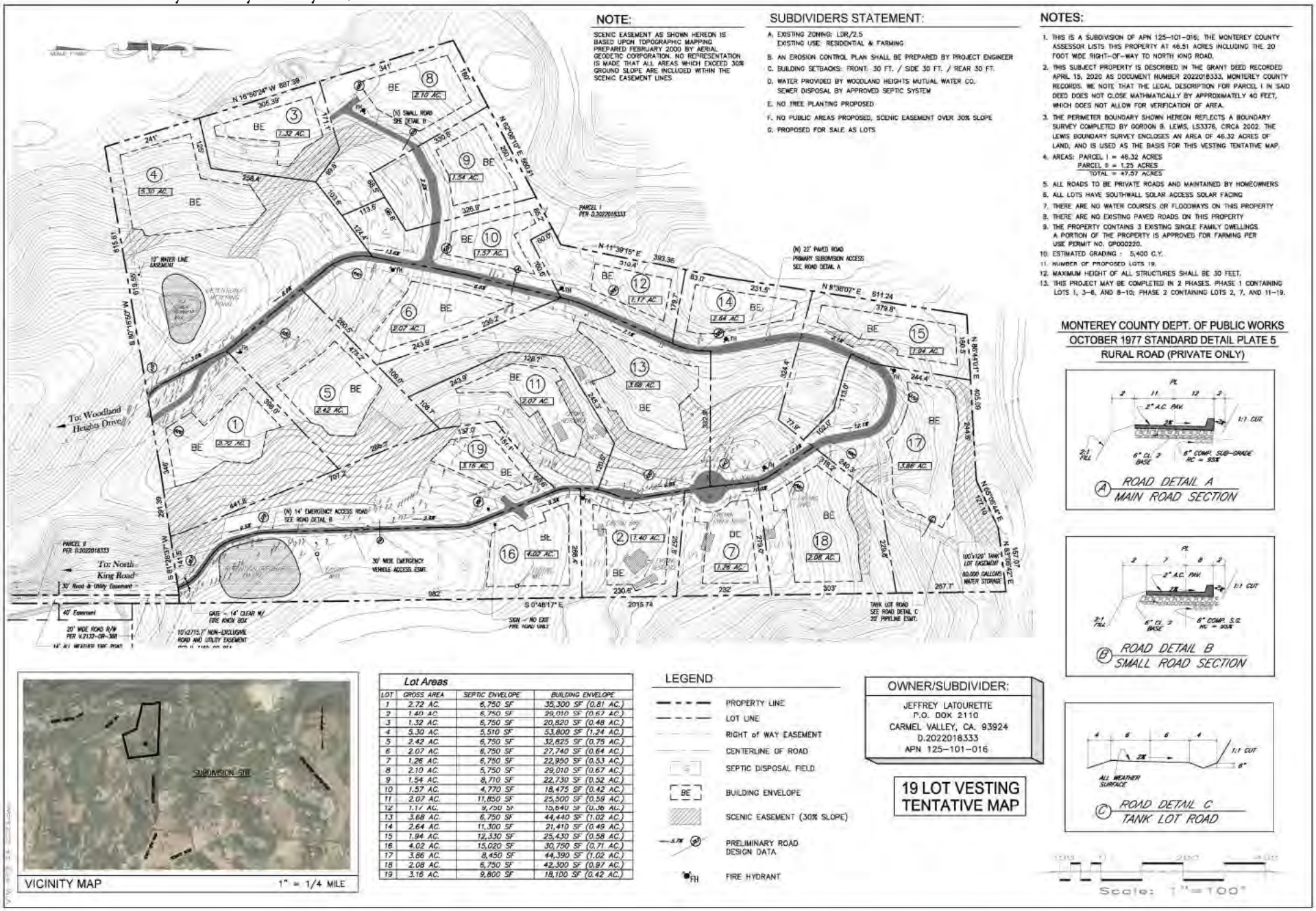
3.2.3 SURROUNDING LAND USES

The Proposed Project site is generally surrounded by rural residential uses. Residential uses are located to the west, north, and east of the site. These areas are designated as Rural Density Residential (5 Acres+/Unit). The Woodland Heights Subdivision, which was approved in 1996, is located to the south of the project site. As discussed above, site access would be provided through the Woodland Heights Subdivision via an easement which was established with the approval of the Woodland Heights Subdivision. Secondary access would occur via King Road. **Figure 3-4** shows surrounding land uses.

3.3 PROJECT BACKGROUND

The Applicant submitted an application for a 19-lot residential subdivision on May 30, 2002, to the County of Monterey. The County deemed the application complete on June 30, 2002, prior to the adoption and implementation of the County of Monterey's 2010 General Plan. According to 2010 Monterey County General Plan Policy LU 9.3, applications that were deemed complete prior to the effective date of the 2010 General Plan, are governed by the plans, policies, ordinances, and standards in effect at the time the Project was deemed complete; therefore, this EIR addresses the Proposed Project's compliance with the policies and objectives of the 1982 Monterey County General Plan and the North County Area Plan adopted by the Board of Supervisors July 2, 1985, as described in **Section 4.10 Land Use, Population, and Housing**. Since the time that the County deemed the application complete the Applicant has made minor modifications to the proposed subdivision to reconfigure the layout of the proposed 19 residential lots. These revisions were intended to respond to comments received from the County concerning the adequacy of on-site septic disposal for several of the lots. **Figure 3-4** shows the reconfigured vesting tentative map overlain on the original vesting tentative map. The overall number of proposed units has not, however, changed since the County deemed the Project complete. The following analysis contained in this EIR evaluates the potential environmental effects associated with the reconfigured subdivision under the 1982 General Plan. **Figure 3-5** shows the land uses surrounding the Proposed Project.

Source: Monterey County Surveyors, 2023



Vesting Tentative Map

Date	Figure
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Planning and Environmental Consulting

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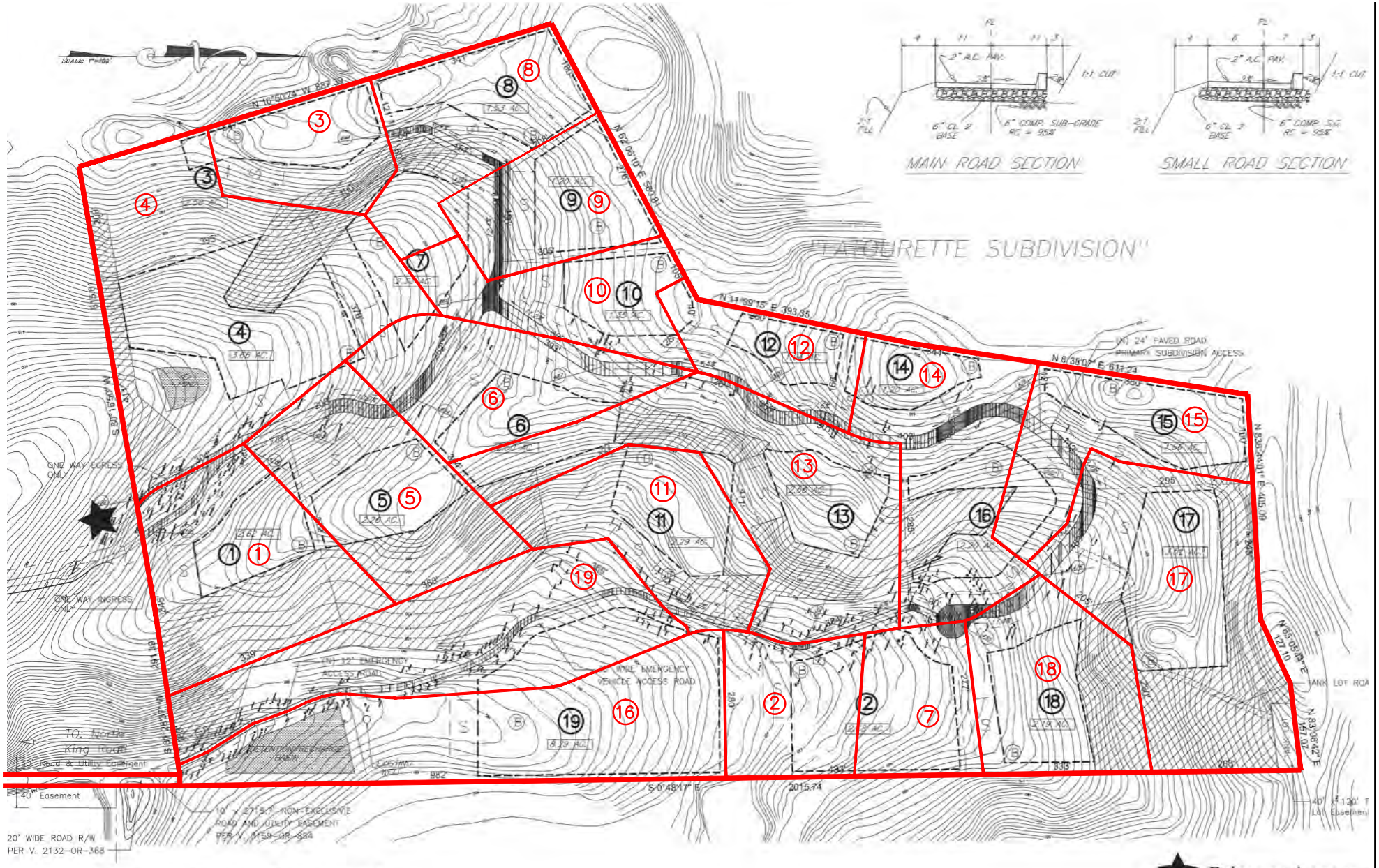
Source: Monterey County Surveyors, Inc., 2015



Source: Monterey County Surveyors, Inc. LOT LINES SHOWN IN RED ARE SOURCED FROM FEBRUARY 5, 2015 REVISION OF VESTING TENTATIVE MAP

Comparison of Original and Revised VTMs	Date 12/16/2021	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 3-4
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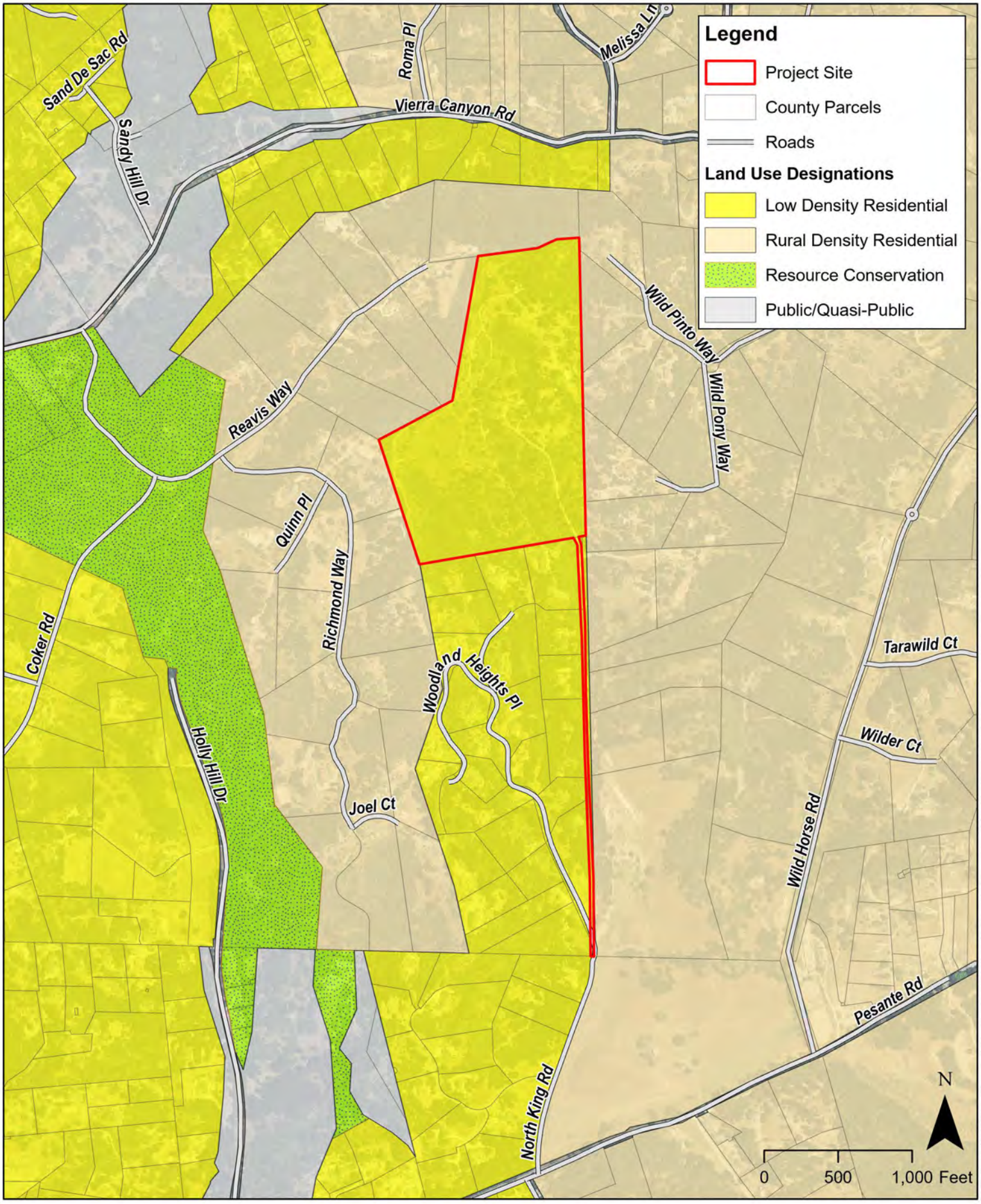

Surrounding Land Uses

Date 6/29/2022

Scale 1:10,000

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure 3-5

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3.4 PROJECT OBJECTIVES

CEQA Guidelines Section 15124(b), requires that an EIR include a statement of project objectives. More specifically, CEQA Guidelines Section 15124(b), identifies that an EIR shall include "a statement of the objectives sought by the proposed project. A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings of a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project." Pursuant to CEQA Guidelines Section 15124(b), the project objectives are as follows:

- to provide low-density housing in an identified residential area of the County, and on a site that is surrounded by existing residential development;
- to help the County meet its housing goal mandated by the State; and,
- to increase the economic value of the land both in terms of land value and tax revenue for the County.

3.5 PROJECT CHARACTERISTICS

3.5.1 STANDARD SUBDIVISION

As shown in **Figure 3-3**, the Proposed Project would subdivide the 47.57-acre parcel to allow for the development of 19 residential lots. The lots range in size from 1.17 acres to 5.3 acres in size. **Table 3-1** identifies the lot acreage, septic envelop square footage, and acreage of scenic easement for each of the individual parcels. In addition, the Project also includes infrastructure improvements, including the construction of an internal roadway network, water system improvements, drainage facilities, and related improvements. Each of these elements is described separately below.

Table 3-1
Gross Lot Area, Septic Envelope Square Footage, and Scenic Easement Acreage

Lot No.	Lot Area (ac)	Septic Envelope (sf)	Scenic Easement (acres)
1	2.27	6,750	0.81
2	1.40	6,750	0.67
3	1.32	6,750	0.48
4	5.30	5,510	1.24
5	2.42	6,750	0.75
6	2.07	6,750	0.64
7	1.26	6,750	0.53
8	2.10	5,750	0.67
9	1.54	8,710	0.52
10	1.57	4,770	0.42
11	2.07	11,850	0.59
12	1.17	9,750	0.36
13	3.68	6,750	1.02
14	2.64	11,300	0.49
15	1.94	12,330	0.58
16	4.02	15,020	0.71
17	3.86	8,450	1.02

Lot No.	Lot Area (ac)	Septic Envelope (sf)	Scenic Easement (acres)
18	2.08	6,750	0.97
19	3.16	9,800	0.42

Sources: Vesting Tentative Map prepared by Monterey County Surveyors, Inc., revised April 24, 2023.
Septic Envelop Plans, Taluban Engineering, Inc.

3.5.2 GRADING

The Proposed Project would require approximately 9,220 cubic yards of cut and 6,410 cubic yards of fill for proposed residences, construction of an access road, and other infrastructure. An additional 1,200 cubic yards may be required for the improvements to the external access road. There are no building plans for the lots currently. It is anticipated those will be developed by subsequent lot owners. As such, grading plans for the lots are not specifically addressed in this EIR. The grading plan, showing the proposed areas of cut and fill, is presented in **Figure 3-6a and Figure 3-6ba**. All grading is proposed to balance upon completion of the Project. No import or export of material will be required.

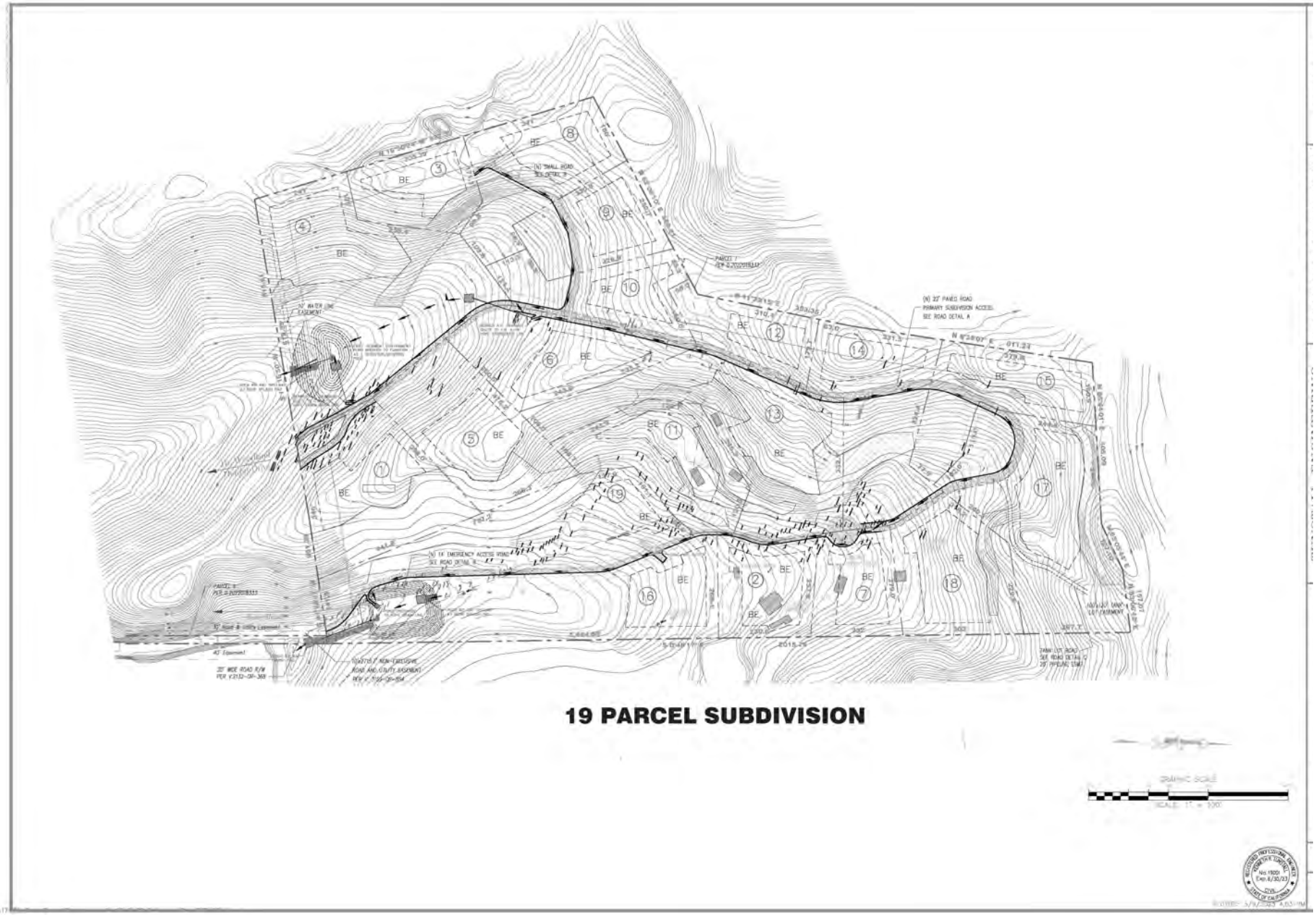
3.5.3 SITE ACCESS AND CIRCULATION

Primary site access would occur via North King Road (a public road) and Woodland Heights Road (a private road) through the existing Woodland Heights subdivision. As shown in **Figure 3-7,** the Proposed Project entails extending the existing private access road through the Woodland Heights subdivision to provide access to the Proposed Project. The proposed internal access road would consist of an approximately 22-foot wide private road, which would provide access to each of the proposed residential lots. Access through the existing Woodland Heights subdivision would occur via an existing easement that was reserved by the Applicant for future residential development of the site at the time the Applicant developed the Woodland Heights subdivision.

The internal roadway network would consist of a general loop that would connect the primary access and secondary access location. The internal roadway network also includes a 14-foot-wide private road within the subdivision that would provide access to Lots 3, 8, 9, and 10. Secondary access would be provided via North Kind Road. The emergency access would consist of a 14-foot-wide private road that would extend from North King Road along substantially the same alignment as the existing unpaved road that currently provides access to the existing residential uses on the property. The existing access road would require additional grading and related improvements to meet contemporary roadway design standards.[1] **Figure 3-7** shows the proposed internal circulation network.

[1] The Project Applicant has also identified that the proposed secondary access could be improved to provide primary access to the site. At this time, the Applicant has not, however, provided any detailed plans, grading estimates, or other information regarding the use of the secondary access point as a primary access.

Source: Tunstall Engineering, 2023.



Grading Plan	Date 09/18/2024	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 3-6a
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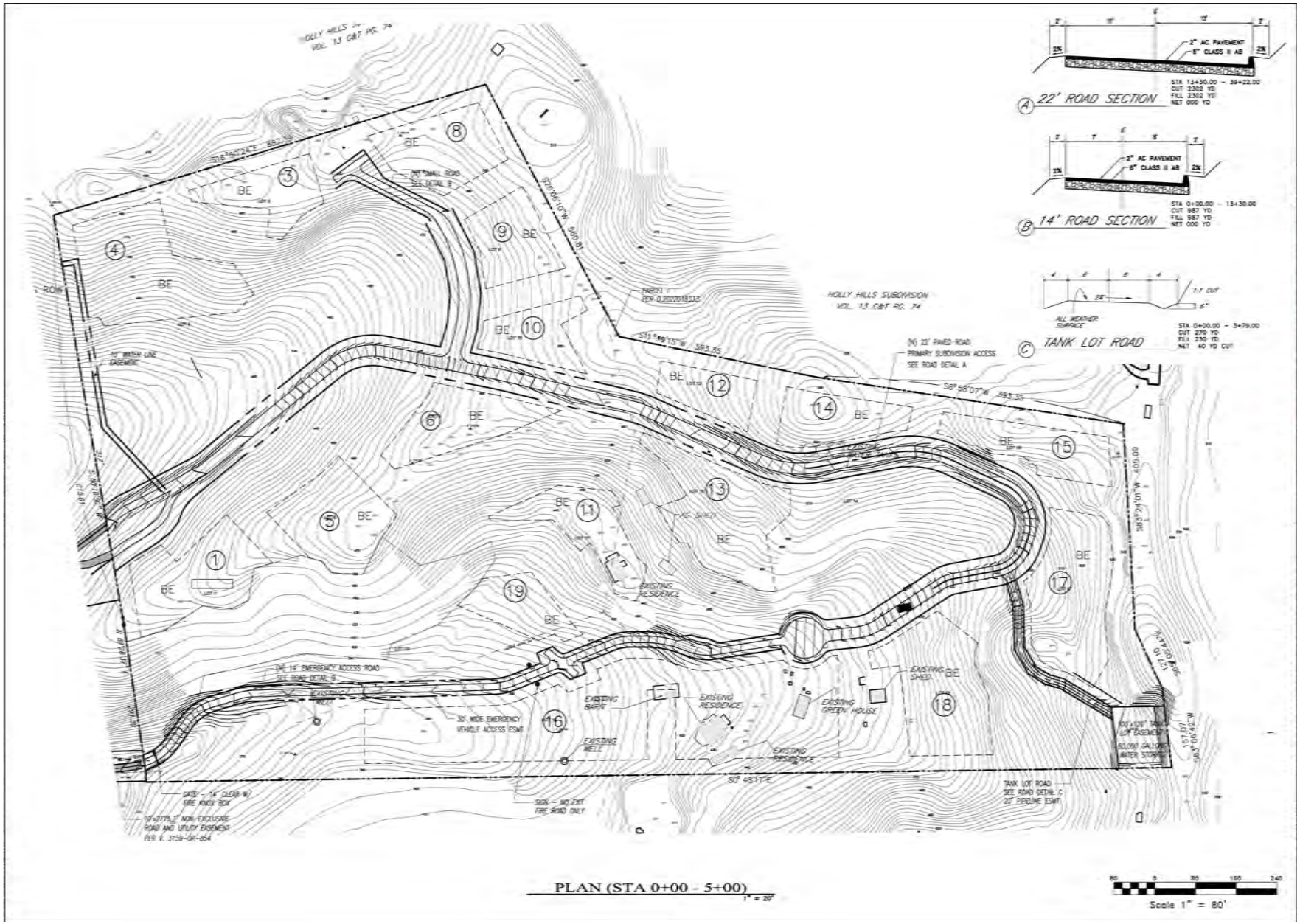
Source: C3 Engineering, 2023.



Grading Plan - Roadway	Date 09/18/2024	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 3-6b
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Circulation Network

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6/29/2022

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Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure
3-7

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3.5.4 STORM DRAINAGE SYSTEM

The Project would construct a storm drainage system to convey storm runoff from the site into two (2) onsite drainage facilities. Drainage inlets would be located along driveways and the primary access road. In landscaped areas, flat grate inlets would be installed at low points. The storm drainage mains would be located within the access road alignment, except where they exit the street to discharge into the basins. An existing sediment containment area currently exists within the proposed boundaries of Lot 4. **Figure 3-3** shows an additional proposed drainage facility located on the southeastern portion of the site on Lot 16. **Section 4.9, Hydrology and Water Quality** evaluates the potential drainage related effects associated with the Proposed Project.

3.5.5 WATER SYSTEM

The Woodland Heights Mutual Water Company ("MHWC") would be responsible for providing water service to the Proposed Project. The MHWC currently serves the 19-lot Woodland Heights subdivision, which is immediately south of the Proposed Project, with a single groundwater well. The Salinas Valley Water Project ("SVWP") provides the long-term management and protection of groundwater resources in the region and is funded by a special assessment zone referred to as Zone 2C. The property is in Zone 2C. Water supply is discussed and evaluated in **Section 4.15, Water Supply.** Source Capacity testing has demonstrated there is an adequate long-term water supply for the Project. A second groundwater well will be installed as a condition of approval of the subdivision to serve as a standby well.

3.5.6 WASTEWATER DISPOSAL

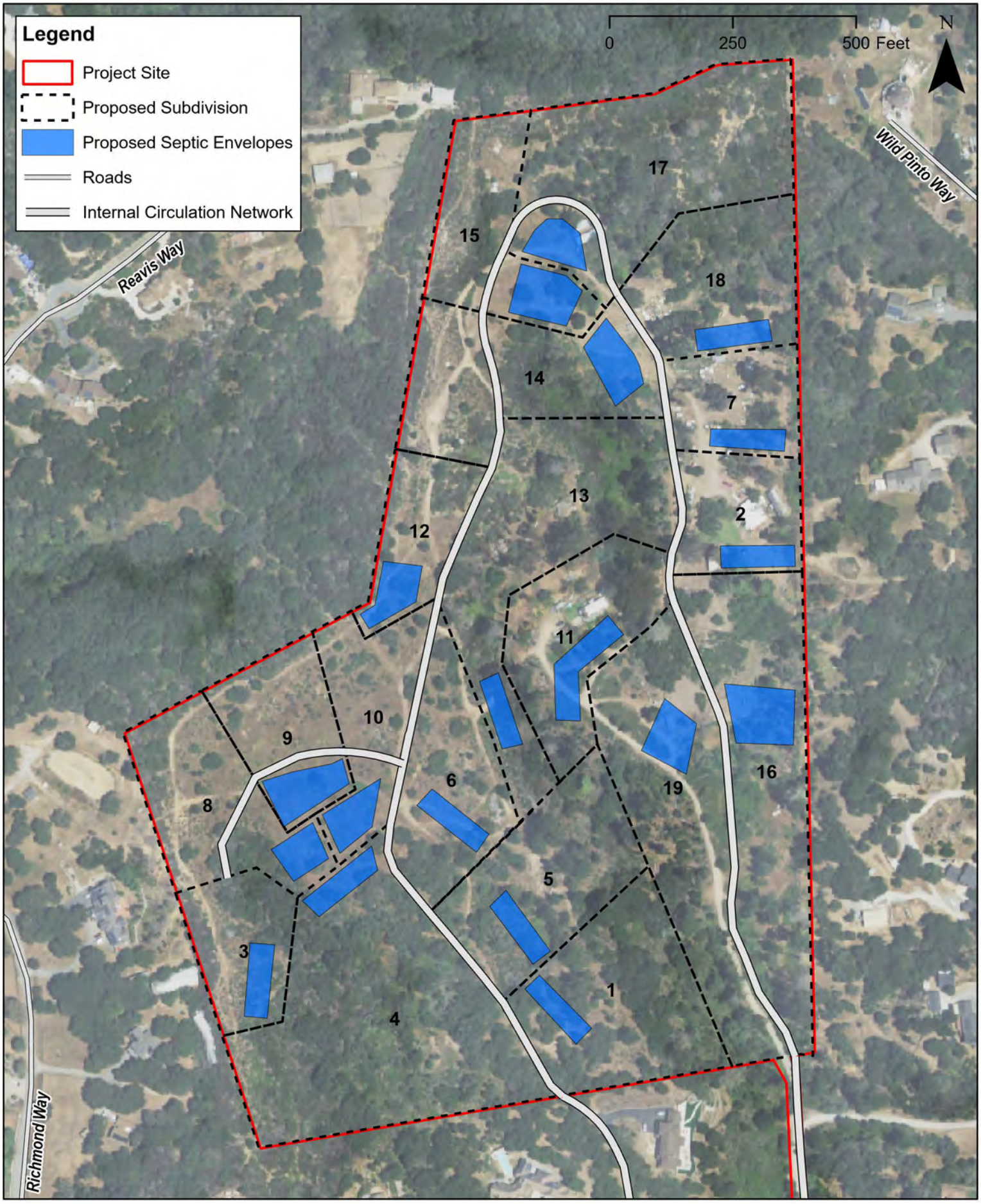
Wastewater generated in connection with the Proposed Project would be disposed of on-site via on-site wastewater treatment systems (i.e., septic). Individual septic systems would be constructed as part of future residential buildout of the site. The proposed septic envelopes for each of the individual lots are depicted in **Figure 3-8. Table 3-2** below includes the area of each of the septic envelopes. The wastewater disposal system is evaluated in **Section 4.14, Wastewater Disposal.**

3.5.7 UTILITIES

Electrical, telephone, internet, and television services will be provided by Pacific Gas & Electric ("PG&E"), AT&T, and satellite, respectively. The applicant will be required to provide on-site facilities to meet the demand for these services. These services are discussed in more detail in **Section 4.12, Public Services**.

3.5.8 SITE PREPARATION & DEMOLITION

Access roads and septic envelopes will not be located on slopes greater than 30 percent. The Proposed Project would require the demolition of existing on-site residences, existing agricultural support structures, and other site improvements to accommodate the development. In addition, the Proposed Project would require vegetation removal including the removal of some oak trees and native vegetation to accommodate the Proposed Project infrastructure. The majority of vegetation is located within the undisturbed areas of the Project site.



Septic Envelopes

Date 6/29/2022

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Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure 3-8

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3.5.9 TREE REMOVAL

The Proposed Project is estimated to result in the removal of a minimum 108 Coast live oak trees (*Quercus agrifolia*) and 41 Monterey pine (*Pinus radiata*) of varying health, condition and size in connection with the development of infrastructure improvements. In addition, the Project would result in tree removal as part of future residential development of individual lots. More specifically, a minimum of 20 oaks and 30 pine trees are estimated to be removed as part of future residential buildout of the subdivision. These are conservative estimates based on the results of the Forest Management Plan ("FMP") prepared for the project by Staub Forestry and Environmental Consulting ("Staub") in 2006 and updated by DD&A in 2021, which was prepared prior to the designation of building envelopes on the vesting tentative map. As a result, actual tree removal in connection with subdivision improvements and residential buildout may vary. As subdivision improvements are installed and individual lots are developed, tree removal would be evaluated on an individual basis to ensure that actual tree removal does not exceed anticipated tree removal identified in this EIR (see **Section 4.3 Biological Resources**).

3.6 PROJECT CONSTRUCTION/PHASING

Construction of the Proposed Project and infrastructure improvements would generally involve tractors, backhoes, compactors, rollers, dump trucks, etc. Most of the equipment would be brought to the site at the beginning of work and remain until the completion of construction. As necessary, trucks would bring materials such as water pipes, gravel, and asphalt for the road, etc. to the site. These deliveries would likely take place over a short period of time (e.g., less than a month). The estimated number of construction workers on-site at any one time to complete the infrastructure improvements is approximately 20. The start of construction of the Proposed Project depends on the project approval date, seasonal factors, market conditions, and the contractor's schedule.

3.7 INTENDED USES OF THIS DRAFT EIR

This EIR is an informational document for both agency decision-makers and the public. The County is the lead agency responsible for certification of the Final EIR and approving land use permits related to the Proposed Project. As mandated by CEQA Guidelines Section 15124(d), below is a list of approvals required by the County of Monterey. Project entitlements would include, but not be limited to:

- Combined Development Permit, consisting of the following:
    - Standard Subdivision Vesting Tentative Map;
    - Use Permit for expansion of the Woodland Heights Mutual Water System to provide additional water connections necessary for the proposed lots;
    - Use Permit for removal of protected trees;
    - Use Permit for development on slopes greater than 30%;
- Grading Permit(s) (Housing and Community Development ("HCD") – Building);
- Building Permit(s) (HCD – Building);
- Demolition Permit for existing structures;

- Well Drilling and Well Destruction Permits; and,
- Encroachment Permit for improvements on King Road.

Other agencies with permit or review authority over some aspect of the Project may include Caltrans, Transportation Agency of Monterey County ("TAMC"), Regional Water Quality Control Board, Monterey Bay Air Resources District ("MBARD"), and the California Department of Fish & Wildlife ("CDFW").

Chapter 4 ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

INTRODUCTION

This section of the EIR provides an overview of the approach used to evaluate the Proposed Project, describes the contents of the technical sections presented in this chapter, and describes the "environmental baseline" that is used for the purposes of evaluating the Proposed Project's potential environmental effects. Each section in this chapter includes a description of the existing environmental setting relevant to that topical CEQA section, a description of existing regulatory requirements, and an evaluation of the Proposed Project's effects. If necessary, mitigation measures that would reduce potential effects to a less-than-significant level are described.

APPROACH

Each section of this EIR describes each of the environmental categories that may be affected by the Proposed Project. Each topical CEQA section consists of four (4) parts: Introduction, Environmental Setting, Regulatory Environment, and Impacts and Mitigation Measures. Each section also identifies applicable references.

- **Introduction:** describes the topical CEQA section and identifies the various documents that were utilized to evaluate the potential topical impacts associated with the Proposed Project.
- **Environmental Setting:** describes the existing project setting for each topical section (e.g., air quality, biological resources, etc.). This section constitutes the baseline physical conditions by which the lead agency determines the significance of the impact.
- **Regulatory Environment:** describes the applicable federal, state, and local policies and regulations for each topical CEQA section.
- **Impacts and Mitigation Measures:** evaluates the potential environmental impacts associated with the Proposed Project and identifies the significance of impacts. Where appropriate, this section also identifies applicable mitigation measures to lessen the extent of potential project-related effects.
- **References:** provides a list of all authors and agencies that assisted in the preparation of the report by name, title, and company or agency affiliation. This section itemizes supporting and reference data used in the preparation of the Draft EIR, and lists agencies, organizations, and other individuals consulted during the preparation of the Draft EIR.

Environmental impacts are described as: less-than-significant, potentially significant, significant adverse, and significant unavoidable. Under CEQA, a significant effect is defined as a substantial, or potentially substantial, adverse change in the environment (Public Resources Code Sec. 21068). CEQA Guidelines Sec. 15382 defines a significant effect as a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project…" The determination of significance must be based on scientific and factual data (CEQA Guidelines Sec. 15064(b)). The specific criteria used for evaluating the potential effects associated with the Proposed Project are identified in each section prior to the impact evaluation. These criteria are consistent with the significance criteria contained in Appendix G of the CEQA Guidelines and local,

regional, and state standards. This EIR uses the following terminology to evaluate potential environmental effects associated with the Proposed Project:

- **Standards of Significance**: A set of criteria used by the lead agency to determine at what level, or "threshold," an impact would be considered significant. Significance criteria used in this EIR include the CEQA Guidelines and Statutes; factual or scientific information; regulatory performance standards of local, state, and federal agencies; and the goals, objectives, and policies of the County of Monterey 1982 General Plan, including the North County Area Plan.
- **Less than Significant Impact**: A less than significant impact would cause no substantial change in the environment, and no mitigation is required.
- **Significant or Potentially Significant Impact:** A significant or potentially significant impact may cause a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of project effects using specified standards of significance. Mitigation measures and/or project alternatives are identified to reduce project effects to the environment.
- **Significant or Potentially Significant Unavoidable Impact:** A significant (or potentially significant) and unavoidable impact would result in a substantial adverse change in the environment for which no feasible mitigation is available to reduce the impact to a less than significant level, although mitigation may be available to lessen the degree of the impact.
- **Cumulative Impact:** Cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

This EIR analyzes the potential direct and indirect effects associated with the implementation of the Proposed Project. CEQA Guidelines Sec. 15358(a)(1) defines the direct or primary effects of a project as those effects that are "caused by the project and occur at the same time and place" as the project. A direct effect is a physical change that is "caused by and immediately related to the project" (CEQA Guidelines Sec. 15064(d)(1)). Indirect or secondary effects are "caused by the project and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems" (CEQA Guidelines Sec. 15358(a)(2)). An indirect physical change in the environment is "not immediately related to the project, but which is caused indirectly by the project" (ibid.). An EIR only needs to evaluate indirect effects that are reasonably foreseeable (CEQA Guidelines Sec. 15358(a)(2)).

In addition to evaluating the Proposed Project's potential direct and indirect effects, this EIR also includes a brief evaluation of the Project's potential effects that were found not to be significant. CEQA Guidelines Sec. 15128 states that "an EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a Project were determined not to be significant and were therefore not discussed in detailed in the EIR." **Chapter 5.0, CEQA Considerations**, includes an evaluation of each of the individual topical CEQA sections where the Proposed Project would result in no impact or impacts would be less-than-significant. This EIR determined that the Proposed Project would not have any potentially significant direct effects in the following areas: Agricultural and Forestry Resources, Mineral Resources, Recreation.

TECHNICAL RESOURCES EVALUATED IN DETAIL IN THIS EIR

This EIR includes the following technical resource sections:

- Section 4.1, Aesthetics
- Section 4.2, Air Quality
- Section 4.3, Biological Resources
- Section 4.4, Cultural and Tribal Resources
- Section 4.5, Energy
- Section 4.6, Geology and Soils
- Section 4.7, Greenhouse Gas
- Section 4.8, Hazards and Hazardous Materials
- Section 4.9, Hydrology and Water Quality
- Section 4.10, Land Use, Population, and Housing
- Section 4.11, Noise
- Section 4.12, Public Services
- Section 4.13, Transportation
- Section 4.14, Wastewater Disposal
- Section 4.15, Water Supply

This EIR also includes an evaluation of potential growth-inducing impacts, cumulative impacts, and effects found not to be significant in **Chapter 5.0, CEQA Considerations**. Alternatives to the Proposed Project are discussed in **Chapter 6.0, Alternatives**.

BASELINE ENVIRONMENTAL CONDITIONS

According to CEQA Guidelines Sec. 15125, an EIR should include a description of the existing physical environmental conditions in the vicinity of the project to provide the "baseline physical conditions" against which project-related changes can be compared. Specifically, CEQA Guidelines Sec. 15125(a) requires that an EIR include a description of "the physical environmental conditions in the vicinity of a project, as they exist at the time... [the] environmental analysis is commenced..." Normally, the baseline condition is the physical condition that exists at the start of the environmental review process or when the NOP is published. These conditions would constitute the baseline physical conditions by which the CEQA lead agency determines whether an impact is significant.

While the environmental baseline is normally the physical conditions at the time the NOP is published, the CEQA Guidelines and recent court decisions (see for instance *Cherry Valley Pass Acres and Neighbors v. City of Beaumont*; see also *Communities for a Better Environment v. South Coast Air Quality Management District (2010) 48 Cal.4th 310*; see also *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority, et al (2013) 57 Cal.4th 439*) recognize that an alternate baseline, and in some instances a future baseline, may be appropriate. In general, the appropriate CEQA baseline is the existing environmental conditions at the time the NOP was published or the time the environmental analysis commenced. In determining the appropriate environmental baseline for evaluating potential air quality impacts, the California Court of Appeal, found in *Communities For a Better Environment v. South Coast Air Quality Management District, et al., 48 Cal. App. 4th 310 (2010)* that the appropriate CEQA baseline consisted of the physical environmental conditions existing at the time of analysis. The decision stated that a long line of Court of Appeal decisions hold that the impacts of a proposed project are ordinarily to be compared to the actual environmental conditions existing at the time of environmental analysis and these decisions concluded that the baseline for CEQA analysis must be the "existing physical conditions in the affected area," that is, the "real conditions on the ground."

The environmental review process for the Proposed Project was initiated in 2004. The County published the NOP on July 20, 2004. Under normal conditions, this date would represent the environmental baseline condition for the purposes of CEQA. As described above, the courts have held that an alternate baseline may

be appropriate, particularly in instances where there are several years between the time of NOP issuance and EIR preparation. If significant time has elapsed since the time the environmental review commenced (i.e., NOP publication) and the release of the EIR, the EIR must include an explanation of why the earlier baseline is appropriate. Considering the significant time lapse between the release of the NOP and preparation of the EIR, the environmental baseline for the purposes of this EIR is the physical environmental conditions as they exist at the time of EIR preparation in 2022.

4.1 AESTHETICS

4.1.1 INTRODUCTION

This section evaluates the potential aesthetic impacts associated with the development of the Proposed Project. The following section: 1) describes the environmental setting, 2) identifies the regulatory requirements applicable to the Proposed Project, and 3) evaluates the potential environmental effects associated with the Proposed Project and identifies applicable mitigation measures to reduce the extent of impacts to a less than significant level, where feasible. **Table 4.1-1** summarizes the anticipated environmental effects of the Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.1.4, Impacts and Mitigation Measures**.

Table 4.1-1
Summary of Aesthetics Environmental Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measure	Residual Impact
AE-1	The Proposed Project would not have a substantial adverse effect on a scenic vista. Although the Proposed Project would transform a primarily undeveloped site into a new residential subdivision, the Proposed Project would not substantially impact a scenic vista. The Proposed Project would be consistent with the existing rural residential character of the area and would not generally be visible from any common public viewing area.	Less than significant	None	Less than significant
AE-2	The Proposed Project would not substantially degrade existing visual character or quality of the site or its surroundings. The Proposed Project could be visible from existing residences; however, the Proposed Project is consistent with the existing rural residential character of the surrounding area.	Less than significant	None	Less than significant
AE-3	The Proposed Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. The Proposed Project would comply with standard conditions of approval to control off-site illumination and glare.	Less than significant	None	Less than significant

4.1.2 ENVIRONMENTAL SETTING

4.1.2.1 Regional Landscape

The Monterey Bay Area is known for its dramatic coastline and picturesque landscapes. The topography of the region varies from flat, farmed areas, to rolling hills with broad valleys, to steep slopes, rugged canyons, and prominent ridges of the Coast Range. Elevation in the region range from sea level to 3,000 feet within the peaks and ridges of the Big Sur and Los Padres National Forest areas. Small creeks in the region are vegetated with sycamore, Douglas fir, redwood, bay oak, and willow trees. Hillsides and ridges are vegetated with forests and chaparral shrublands, with areas of open grassland on slopes and in the valleys. North County is an area of

diverse natural landscapes providing an abundance of visual resources that can be appreciated from a number of roads and highways (NCAP, 1985).

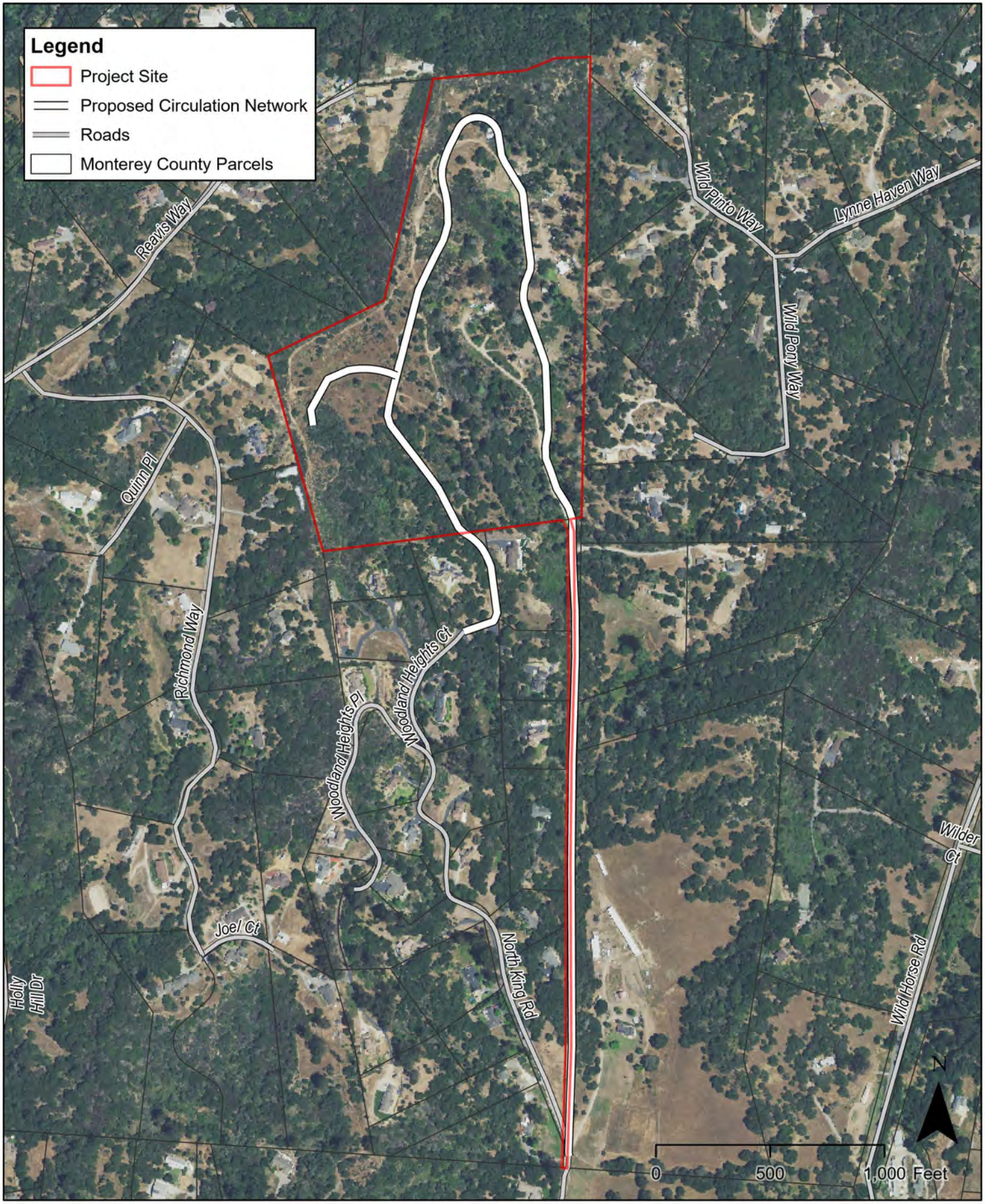
Monterey County pioneered the scenic highway concept in the State of California. The visual diversity of the surrounding area as viewed from scenic corridors has been identified as a valuable resource of Monterey County.

4.1.2.2 Project Site Setting

The Project site is within a small canyon in the foothills of the northern terminus of the South Coast Ranges in north Monterey County, near Prunedale. The existing visual character of this area is comprised of distant mountain ranges, grazing land, and rural development (see **Figure 4.1-1**). The Project site consists of gentle rolling hills with occasional steep to moderately steep flanks cut by several broad, flat-bottomed drainages, and numerous narrow side hill drainage swales. Vegetation in the area includes a combination of oak woodland, coast range grassland, and maritime chaparral habitats. The Project site contains existing residential structures (i.e., mobile homes), limited agricultural structures (e.g., small livestock pins, poultry coops, and horse stalls), and other infrastructure. The Proposed Project consists of improvements to the existing residential structures to include 16 new single-family residences and replacing the existing three residential structures for a total of 19 single-family residences. The property is generally surrounded by rural residential uses to the north, south, east, and west, including a 19-lot subdivision to the south (i.e., Woodland Heights Subdivision). As a result, surrounding land uses contribute varying amounts of glare and light throughout the day and night. Existing on-site residential uses (mobile homes) also contribute varying amounts of glare and light (see **Figures 4.1-2a – 4.1-2c**).

The Proposed Project is not within a visually sensitive area (NCAP, 1985), nor is the Project site located within view of a designated scenic highway. The California Department of Transportation ("Caltrans") has designated and/or determined eligibility for scenic highways designation for two (2) state highways in the project area. These highways include State Route ("SR") 1 and SR 156. Caltrans has determined the portion of SR 1 to 1.0 mile east of Castroville as being eligible for Scenic Highway designation. The segment of SR 156 which extends 1.0 mile east of Castroville to U.S. Route ("U.S.") 101 near Prunedale, is a designated Scenic Highway.

There are no locally designated scenic roads in the Project area. The County of Monterey North County Area Plan identifies Crazy Horse Canyon Road and Holly Hill Drive as a proposed scenic route within the Project vicinity.



Aerial Map

Date
6/29/2022

Scale
1:6,500

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure
4.1-1

Source: Monterey County Parcel Map, 2022

E:\GIS\GIS_Projects\2427 La Tourette\Working\2022_MapUpdates\LaTourettes_MapUpdates2022\LaTourettes_MapUpdates2022.aprx



Photo 1. View of central portion of the project site looking north.



Photo 2. View of lot #1 looking west from internal road.



Photo 3. View of lot #9 and lot #10 looking west from internal road.

Site Photographs	Date 06/10/2022 Scale N/A	**Denise Duffy & Associates, Inc.** Planning and Environmental Consulting	Figure 4.1-2a



Photo 1. View of lot #1 looking northeast from internal road.



Photo 2. View of lot #15 and #17 looking southeast from internal road.



Photo 3. View of lot #1 and #5 looking southeast from internal road.



Photo 4. View of lot #3 looking southwest from internal road.

Site Photographs	Date 06/10/2022	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 4.1-2b
	Scale N/A		



Photo 1. View of an existing single family residence.



Photo 2. View of existing support structures and debris.



Photo 3. View of existing support structures.



Photo 4. View of existing water tanks looking east.

Existing Development	Date 06/10/2022	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 4.1-2c
	Scale N/A		

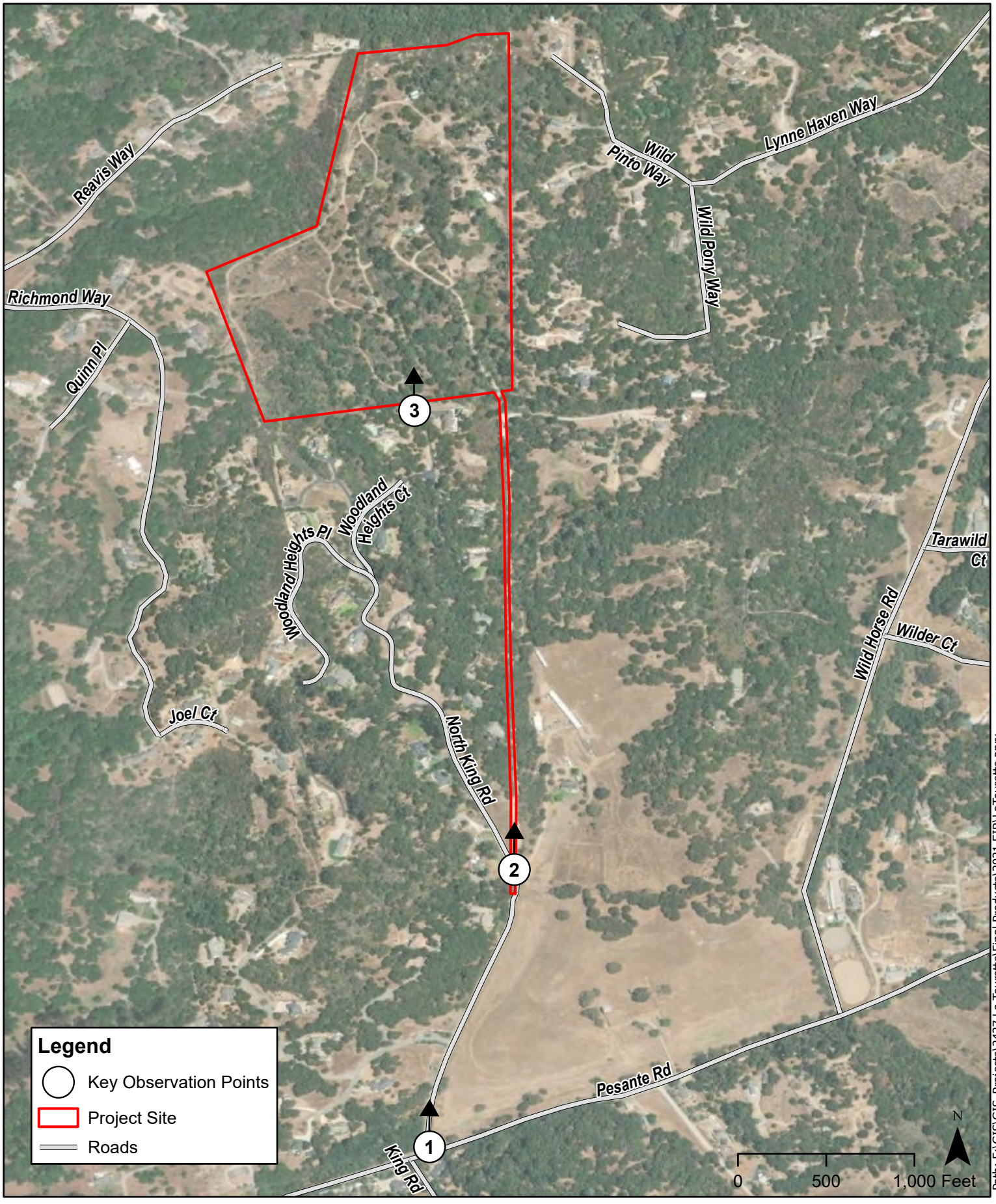
4.1.2.3 Proposed Project Viewshed

The viewshed or area of potential visual effect[1] is limited. The Project site is generally not visible from any public roadway. The site is not visible from SR 1 or SR 156. The nearest moderately trafficked public roadways are Pesante Road and Vierra Canyon Road, which are located to the south and north of the site, respectively. Existing views of the site are dominated by rolling hills and rural development. The site is not visible from Vierra Canyon Road or Pesante Road. The nearest residences are located approximately 700 to 1,000 feet in any given direction from the Project site. As mentioned above, the Project site is not visible from any public roads apart from North King Road, where an alternative access would be provided, and construction of the new access driveway would be visible.

The Project site is isolated and is not in an area that is widely traveled or visited or within a designated scenic corridor (as discussed above). There are no notable local, state, or regional parks or other heavily used public recreational facilities that are adjacent to or overlook the Project site. Therefore, the potential aesthetic and visual impacts analysis is based on views from local rural roadways in the area. The following Key Observation Points ("KOPs") represent common public viewing locations with views looking towards the site.[2] The KOPs collected during the January 2022 site visit are listed below and are shown in **Figure 4.1-3**.

- *KOP 1: Pesante Road/North King Road.* KOP 1 is south of the Project site at the intersection of Pesante Road and North King Road. This KOP is one (1) mile south of the Project site and represents an area where automobiles traveling east or west along Pesante Road could potentially view the Project site.
- *KOP 2: North King Road/Private Access Drive.* KOP 2 is south of the Project site at the intersection of North King Road and a private access road that currently serves as the entrance to the Project Site. KOP 2 is north of KOP 1 and is approximately a half (0.5) mile from the Project site. Views of the Project site from KOP 2 would potentially be available by automobiles traveling north or south along North King Road. Only the proposed alternative access road would be visible from this location.
- *KOP 3: Woodland Heights Court/Private Access Drive.* KOP 3 is located south of the Project site at the north terminus of Woodland Heights Court and the existing private access gate to the Project site. Primary access to the Proposed Project would occur from this location. Woodland Heights Court is a private road, accessible by residences of the Woodland Heights Subdivision. As a result, this KOP does not constitute a common public viewing location as defined by the County of Monterey. Views from this location consist entirely of private views.

[1] Viewsheds or areas of potential visual effect are areas within which the project could potentially be visible.
[2] KOP 3 is not a common public viewing location per Monterey County Code Sec. 21.06.195. KOP 3 represents a private viewing location from within an existing subdivision. This KOP is included for informational purposes only.



Key Observation Points

Date
7/1/2022

Scale
1:8,500

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure
4.1-3

4.1.2.4 Existing Visual Character

The characterization of the existing visual quality of the Project site and surrounding area is based in part on observations at site visits conducted by DD&A. For the purposes of this analysis, visual character is described using a three-criteria scale system based on the Federal Highway Administration's ("FHWA's") *Visual Impact Assessment for Highway Projects*. The three (3) criteria used are: vividness, intactness, and unity, and are defined as follows:

- *Vividness*. Vividness is the degree of drama, memorability, or distinctiveness of the landscape components. Vividness is composed of four (4) elements – landform, vegetation, water features, and human-made elements – that usually influence the degree of vividness.
- *Intactness*. Intactness is a measure of the visual integrity of the natural and human-built landscape and its freedom from encroaching elements. This factor can be present in well-kept urban and rural landscapes, as well as in natural settings. High intactness means that the landscape is free of eyesores and is not broken up by features that appear to be out of place. Intactness is composed of two (2) primary elements – development and encroachment – that influence the degree of intactness.
- *Unity*. Unity is the degree of visual coherence and compositional harmony of the landscape when it is considered as a whole. High unity frequently attests to the careful design of individual components and their relationship in the landscape.

The concepts utilized to evaluate the visual character and quality of a particular viewing location may be somewhat esoteric or subjective, but these criteria help identify the existing visual environment in a manner that allows a meaningful evaluation of potential project effects. The FHWA's methodology typically assigns numeric ratings to the three criteria – vividness, intactness, and unity – that determine the visual quality and then averages the ratings to establish an overall score. For purposes of this analysis, rather than using numerical ratings, qualitative assessments are provided for each of the criteria and then an overall assessment is provided to assign a "high, medium or low" rating.

Applying this approach provides an evaluation that reasonably represents the range of visual quality and allows identification of viewpoints that may be considered more visually sensitive than other locations. This approach is considered appropriate for the dual purposes of a) determining the visual quality of an area; and b) determining whether the project would (or would not) result in a change in the visual environment that would constitute a substantial adverse visual effect, as defined by the County of Monterey. The overall visual quality categories are described as low, medium, or high, which are defined as follows:

- *Low Visual Quality*. Areas that have low visual quality may have features that seem visually out of place, lack visual coherence, do not have compositional harmony, and contain eyesores.
- *Medium Visual Quality*. These areas can be generally pleasant appearing but may lack distinctiveness, memorability, drama, and compositional harmony, or may simply be common and ordinary landscapes.
- *High Visual Quality*. These areas may be memorable, distinctive, unique, intact natural or park-like areas, or urban areas with strong and consistent architectural and urban design features.

Viewers can be categorized as having low, medium, or high sensitivity to changes in the viewed environment. Viewer sensitivity is strongly influenced by a viewer's activity, awareness of their surroundings, and amount of

time spent looking at a view. People who view a landscape infrequently, view it for short periods of time (often as they pass through it), or are not attentive to it due to focusing on other activities (such as driving) are often less sensitive to changes and are assumed to have low viewer sensitivity. Viewers with average viewer sensitivity include workers and residents who may expect a somewhat pleasant visual setting for the establishments they work in or frequent but are in the locations for purposes other than enjoying its scenery or visual quality. The visual quality of an area can provide a good indication of how responsive an area's most sensitive viewers would likely be to changes in the visual environment. For example, viewers with high viewer sensitivity in areas that are categorized as having high visual quality would be expected to react more to changes in the visual environment than they would in areas that have medium or low visual quality. This concept can help determine areas where a project might be expected to have its greatest impacts on visual resources.

The existing visual setting at each KOP using the characterization method described above are summarized in **Table 4.1-2** and detailed as follows:

Table 4.1-2
Summary of Key Observation Points

KOP	Visual Character	Visual Quality	Viewer Sensitivity
1	Moderate	Moderate	Low
2	Low	Low	Moderate
3	Moderate	Low	Moderate

- *KOP 1*. The existing visual character of the area as perceived from this location is moderate. Views from this observation point look north towards the Project site and include rolling hills to the northeast, existing residences to the west, and oak woodlands to the north. This location has moderate vividness, intactness, and unity. Representative site photos are shown in **Figure 4.1-2a – 4.1-2b.** As mentioned above, this observation point is approximately one (1) mile south of the Project site. The Proposed Project would not be visible from this location due to intervening topography and vegetation which obstruct views of the site. As a result, the Proposed Project would not distract from the views of the immediate surroundings from this observation point.

  This location does not offer particularly distinct or memorable views. Nor is the view from this location intact. However, the surrounding area includes rolling hills, oak woodland, undeveloped grazing land, and existing development (**Figure 4.1-4**). Exiting utility poles and other infrastructure detracts from the visual quality as perceived from this observation point, but generally the view is consistent with a rural setting. Therefore, the visual quality at this location is moderate.

  The Project site is not visible from Pesante Road and North King Road due to the topography of the surrounding area. Although the visual quality and character at KOP 1 is moderate, the Proposed Project is not visible from KOP 1, therefore viewer sensitivity would remain low.

- *KOP 2*. This location is highly disturbed and consists primarily of existing roads (public and private) to the northeast and north, residences to the west, and existing utility poles to the northeast and northwest. **Figure 4.1-5** depicts the existing conditions from this observation point. The Project site is a half mile north of this location, and future residences would not be visible from this location due to the topography and existing vegetation. The secondary access road would be visible from this location. However, this area is currently improved with an existing, albeit unpaved, access road. This location has low visual quality as it lacks vividness, intactness, and unity.



Existing view looking north from the intersection of Pesante Road and North King Road.

KOP#1: Intersection of Pesante Road and North King Road	Date 06/10/2022	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 4.1-4
	Scale N/A		



Existing view looking north from the intersection of North King Road and the Alternative Access Road.

KOP #2: Intersection of North King Road and Alternative Access Road	Date 06/10/2022	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 4.1-5
	Scale N/A		

The visual character of this location is low. Moderately tall fencing runs parallel to North King Road. In addition, there is an existing private access road that connects to the northeast of North King Road (see **Figure 4.1-4**) that is unpaved and currently provides access to the Project site. This access road would be replaced with a new paved road to provide secondary access to the Proposed Project. The land adjacent to the road is disturbed.

Views of the Project site from this KOP would be primarily from residents traveling along North King Road. While the visual quality at this KOP is low, the visual character is low and changes, especially during the construction, could result in moderate viewer sensitivity.

- *KOP 3*. The existing visual character of the area as perceived from this location is considered moderate. The vividness, intactness, and unity are influenced by the presence of relatively undisturbed oak woodland habitat, which create a natural landscape. Views from this location consist of existing vegetation, as well as the existing gate and unpaved access road. See **Figure 4.1-6**.

  The visual quality of the location is moderate. Views from this location consist of oak woodland and existing residential development associated with the Woodland Heights Subdivision.

  As discussed above, this location represents a private viewing location and is not a common public viewing area. The Woodland Heights Subdivision is a gated community, accessible only by residents. While views of future residences would be unlikely due to the site topography and vegetation, viewer sensitivity would still be moderate as changes to the site would be observed by nearby residents.

4.1.3 REGULATORY ENVIRONMENT

4.1.3.1 Federal

No federal regulations relative to scenic or visual resources would be applicable to the Proposed Project.

4.1.3.2 State

California Scenic Highways Program. The California State Scenic Highway program was created by the Legislature in 1963. Its purpose is to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. The program includes a list of highways that are either designated or eligible for designation as a scenic highway. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Sections 260 through 263. 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. There are no designated or eligible State or County highways within the vicinity of the Project site. However, SR 1, which is located approximately 1.15 miles from the Project site, is a proposed scenic highway. The Project site is not visible from SR 1 due to existing site topography and vegetation, and distance from SR 1.

4.1.3.3 Local

Monterey County 1982 General Plan. The County of Monterey General Plan includes policies related to the preservation of the visual integrity of the area. Please refer to **Table 4.10-4** of the **Land Use, Population, and Housing** section for a detailed analysis of the Project's consistency with the County's General Plan aesthetic and visual resource policies. Relevant policies are listed below:



KOP #3: Woodland Heights Crt. looking into Project Site

Date
06/10/2022

Scale
N/A

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure
4.1-6

26.1.10 The County shall prohibit development on slopes greater than 30 percent. It is the general policy of the County to require dedication of scenic easement on a slope of 30 percent or greater. Upon application, an exception to allow development on slopes of 30 percent or greater may be granted at a noticed public hearing by the approving authority for discretionary permits or by the Planning Commission for building and grading permits. The exception may be granted if one or both of the following findings are made, based upon substantial evidence:

A) There is no alternative which would allow development to occur on slopes of less than 30 percent; or

B) The proposed development better achieves the resource protection objectives and policies contained in the Monterey County General Plan, accompanying Area Plans and Land Use Plans, and all applicable master plans.

26.1.9 In order to preserve the County's scenic and rural character, ridgeline development will not be allowed unless a special permit is first obtained. Such a permit shall only be granted upon findings being made that the development, as conditioned by permit, will not create a substantially adverse visual impact when viewed from a common public viewing area. New subdivisions shall avoid lot configurations, which create building sites that will constitute ridgeline development. Siting of new development visible from private viewing areas may be taken into consideration during the subdivision process.

26.1.20 All exterior lighting shall be unobtrusive and constructed or located so that only the intended area is illuminated, long range visibility is reduced, and off-site glare is fully controlled.

40.2.1 Additional sensitive treatment provisions shall be employed within the scenic corridor, including placement of utilities underground, where feasible; architectural and landscape controls; outdoor advertising restrictions; encouragement of area native plants, especially on public lands and dedicated open spaces; and cooperative landscape programs with adjoining public and private open space lands.

40.2.2 Land use controls shall be applied or retained to protect the scenic corridor and to encourage sensitive selection of sites and open space preservation. Where land is designated for development at a density that would diminish scenic quality, should maximum permissible development occur, the landowner shall be encouraged to voluntarily dedicate a scenic easement to protect the scenic corridor.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The NCAP provides policies for the preservation of the visual integrity of the planning area. Please refer to **Table 4.10-5** in **Section 4.10 Land Use, Population, and Housing**, for a detailed analysis of the Project's consistency with the North County Area Plan's aesthetic and visual resource policies. Relevant policies are listed below:

7.1.3 (NC) To retain the viability of threatened or limited vegetative communities and animal habitats, to promote the area's natural scenic qualities, and to preserve rare, endangered, and endemic plants for scientific study, the conservation of North County's remaining tracts of native vegetation shall be given high priority.

26.1.6.1 (NC) Where new development is permitted in sensitive or highly sensitive areas as shown on the Scenic Highways and Visual Sensitivity Map, the landscaping, building design and siting of the development shall be critically reviewed to maintain the scenic value of the area.

Monterey County Code. The County of Monterey Zoning Ordinance (Title 21) requires an evaluation of potential aesthetic-related effects and a determination of significance from common public view areas. "Common public viewing area means a public area such as a public street, road, designated vista point, or public park from which the general public ordinarily views the surrounding viewshed" (Section 21.06.195). For the purposes of visual impact analyses, Monterey County defines a substantial adverse visual impact as a "visual impact which, considering the condition of the existing viewshed, the proximity and duration of view when observed with normal unaided vision, causes an existing visual experience to be materially degraded" (Section 21.06.1275).

4.1.4 IMPACTS AND MITIGATION MEASURES

4.1.4.1 Thresholds of Significance

A project impact would be considered significant if the project would:

a. Have a substantial adverse effect on a scenic vista;

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within view from a state scenic highway;

c. Substantially degrade the existing visual character or quality of the site and its surroundings; or,

d. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

4.1.4.2 Areas of No Impact

Some of the significance criteria outlined above (b) are not applicable to the Proposed Project, or the Proposed Project would not result in impacts related to this criterion, as explained below. The impact analyses related to the other criteria (a, c, and d) are addressed below under **Section 4.1.4.4 Impact Analysis.**

b. *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within view from a state scenic highway.* State designated Scenic Highways within Monterey County include SR 68, SR 156, and portions of SR 1 south of Monterey. Additionally, portions of SR 1, north of Monterey, and U.S. 101 are designated as eligible State Scenic Highways. The Proposed Project would not be visible from a designated or eligible State Scenic Highway. Therefore, there would be no impact.

4.1.4.3 Methodology

This section describes the methods used to evaluate the potential aesthetic-related impacts associated with the Proposed Project. The environmental setting information was developed based on a review of site photographs and aerial imagery, identification of observation points that are representative of "common public viewing areas" in the vicinity of the Proposed Project, and visual observations of the surrounding area to identify areas of special interest or potential scenic value. DD&A conducted a site visit on July 26, 2004, January 1, 2005, May 16, 2016, January 10, 2019, January 18, 2019, August 23, 2022, and January 21, 2022. DD&A staff collected photos of the site to document existing conditions. The discussion above describes the visual character of the potentially affected viewsheds in the Project vicinity, identifies the types of viewer groups that could potentially see the Project site and associated improvements, and describes their sensitivity to changes in the viewed environment (viewer sensitivity). This assessment uses the terminology and methodology based on the system developed by FHWA for assessing the visual effects of highway projects (see FHWA's *Visual Impact assessment of Highway Projects*).[3] The following visual analysis is based on the potential for the Proposed Project to alter the existing visual character of the site and surrounding areas. In assessing the visual quality of a site, it is important to consider that visual quality is not determined solely by the physical attributes of a Proposed Project, but also by the relationship between the Proposed Project and the total visual environment.

4.1.4.4 Impact Analysis

Impact AE-1: The Proposed Project would not have a substantial adverse effect on a scenic vista. Although the Proposed Project would transform a primarily undeveloped site into a new residential subdivision, the Proposed Project would not substantially impact a scenic vista. The Proposed Project would be consistent with the existing rural residential character of the area and would not be visible from any common public viewing area. This represents a less than significant impact. No mitigation measures are necessary. (Criterion a).

The Proposed Project would not have a substantial adverse effect on a scenic vista. The Project site is predominantly undeveloped except for several existing outbuildings and residential structures (mobile homes) located on the northeast portion of the site (**Figure 4.1-2c**). The existing structures would be demolished as part of site preparation for the new homesites. As previously identified, the surrounding Project vicinity consists primarily of rural residential uses. As such, views of the surrounding area consist predominantly of existing rural uses. Scenic vistas that are in the Project vicinity include distant views of the Gabilan Mountain Range and the Santa Lucia Mountain Range.

A visual reconnaissance of the Project site was conducted to assess project-related impacts on the visual quality of the surrounding area. While the Proposed Project would result in increased development on the site by introducing new residential uses and associated infrastructure on a relatively undeveloped site, the Proposed Project would not be visible from adjacent common public viewing areas. As noted above, the Proposed Project would not be visible from any of the observation points identified as part of the visual reconnaissance of the site. The Proposed Project, due to site topography and existing vegetation, is not visible from adjacent viewing

[3] The FHWA's methodology was selected because it provides a scientifically valid approach, commonly used under CEQA, to evaluate the potential aesthetic impacts of a project by providing a common evaluation criteria and analytical approach to evaluating potential aesthetic impacts. The FHWA's methodology is generally accepted as suitable for assessing potential aesthetic impacts of transportation and non-transportation projects.

areas. As a result, the Proposed Project would not result in a significant impact to a scenic vista since the Proposed Project would not obstruct distant views of nearby mountain ranges.

While limited, buildout of the proposed lots located along the western perimeter of the Project site would be visible from existing residential uses adjacent to the site. As a result, the Proposed Project could impact existing private views of distant mountains ranges. While development of these lots may obstruct private views of distant scenic vistas, the proposed density and lot sizes are consistent with the rural nature of the Project area and, therefore, would not substantially alter existing views. Furthermore, private views are not considered by the County of Monterey as a scenic resource and are not afforded protection. While Project development could potentially obstruct private views of distant scenic vistas, the Proposed Project would not obstruct views of distant mountain ranges as perceived from common public viewpoints. Therefore, given the topography of the Project site, proposed Project density, existing vegetation, and surrounding development, the Proposed Project would not substantially obstruct scenic views of the either the Gabilan or Santa Lucia Mountain Ranges. **This represents a less than significant impact. No mitigation measures are necessary.**

Significance: Less than Significant.

Mitigation: None.

Impact AE-2: The Proposed Project would not substantially degrade existing visual character or quality of the site or its surroundings. The Proposed Project could be visible from existing residences; however, the Proposed Project is consistent with the existing rural residential character of the surrounding area. This represents a less than significant impact. No mitigation measures are necessary. (Criterion c).

As previously discussed, the Proposed Project site is predominantly undeveloped except for several existing outbuildings and residential structures (mobile homes) located on the northeast portion of the site (see **Figure 4.1-2c**). The Proposed Project would not substantially degrade the existing visual character or quality of the site or its surroundings. Furthermore, the Proposed Project is consistent with the existing rural residential character of the surrounding area. In addition, the Proposed Project would be consistent with the policies contained within the Monterey County General Plan and NCAP.

KOP Analysis

As discussed above, DD&A conducted a site visit on July 26, 2004, January 1, 2005, May 16, 2016, January 10, 2019, January 18, 2019, August 23, 2021 and January 21, 2022. Photos of the three (3) KOPs as shown in **Figure 4.1-4** through **Figure 4.1-6**, are described above.

The Project site is in a rural area, and due to intervening topography and vegetation the Project site would not be visible from KOP 1. Therefore, the Proposed Project would not substantially degrade this viewshed, and therefore would represent a less than significant impact. KOP 2 is located at the intersection of North King Road and the secondary access road, which would be improved as part of the Proposed Project. Applicable improvements include additional grading, realigning, and paving the existing access road to meet contemporary roadway design standards (see **Chapter 3, Project Description**). Construction of these improvements would be visible from KOP 2 and would represent a temporary impact on visual character. Once complete, the access road would not result in a substantial adverse aesthetic-related impact. The existing access road is routinely used

to provide access to the existing on-site residences. The visual character and quality of this KOP is low, and while viewer sensitivity is moderate (primarily during construction) this would remain a less than significant impact as it would not substantially degrade this viewshed.

Monterey County Code Sec. 21.06.195 defines a public viewing area as a public area such as a public street, road, designated vista point, or public park from which the general public ordinarily views the surrounding viewshed. KOP 3 is not a public viewing area as it is within a private subdivision. As discussed below, private views are not afforded protection by the County of Monterey and CEQA does not require an evaluation of potential impacts to private views. However, this EIR includes a brief evaluation of potential aesthetic related impacts for this location for informational purposes only. This information is not used to determine significance, but rather is included to disclose that some private views could be affected by the Proposed Project. KOP 3 contains views into the southern portion of the Project site. The Proposed Project would potentially impact views from existing residences in the Woodland Heights Subdivision. Visible improvements would include the construction of the access road from Woodland Heights Court. Construction of the road would be temporary. While construction of the proposed access road and related improvements would visually transform the site as perceived from adjacent residences, views from this location would be primarily limited to the proposed access road. Views of proposed residences would be limited due to existing topography and vegetation. Views of the site from this viewing location would be consistent with the rural residential character of the surrounding area.

Other Private Views

It is worth noting that although the Proposed Project would not substantially degrade the visual character or quality of the Project site as viewed from common public viewing areas, views from private residences could be potentially affected. This could include views from residences near KOP 3, but could also include views from other private residences. Existing residences along the west and north boundary of the Project site could be impacted by future residential development on Lot 3, 8, 15, and 17 (see **Figure 3-3**). These residences are located between 350 – 700 feet from the Project site boundary. These residences are located atop the ridgeline, at an elevation slightly higher than the Proposed Project. These residences have views of the existing Project site and distant mountain vistas. While the Project site is densely vegetated in areas, the views of the Project site from these residences remain unobstructed. The views from these residences would change from a rural undeveloped landscape to a rural residential landscape with single family homes and associated infrastructure.

The Project site is not in a County-designated visually sensitive area and is not visible form a scenic roadway. The County of Monterey General Plan or NCAP does not protect private views, and CEQA does not require a detailed evaluation of individual private views, particularly when only a limited number of private views would be affected by site development. Therefore, although some homeowners may experience adverse interference with their private views, the impact is not significant for purposes of the CEQA analysis.

Significance: Less than Significant.

Mitigation: None.

Impact AE-3: The Proposed Project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. The Proposed Project would comply with standard conditions of approval to control off-site illumination and glare. This represents a less than significant impact. No mitigation measures are necessary. (Criterion d).

The Project vicinity includes existing rural residential uses. These uses provide a source of light which affect the Project area. The Proposed Project would contribute new sources of light and glare that could accentuate existing sources due to changes in topography, vegetation removal, and the construction of roads and residences. Overall, the Proposed Project would increase the intensity of development within an existing rural area and, therefore, the amount of artificial light. Artificial lighting associated with the Proposed Project could impact nighttime views by altering the natural landscape and, in sufficient quantity, lighting up the nighttime sky, which would reduce the visibility of astronomical features. Standard conditions of approval requiring that all exterior lighting be unobtrusive, harmonious with the local area, and constructed or located so that only the intended area is illuminated, and off-site glare is fully controlled; and compliance with Monterey County Code Sec. 21.63.020 – Design Guidelines for Exterior Lighting, would ensure that Project-related impacts are reduced to a less than significant level. **This represents a less than significant impact. No mitigation measures are necessary.**

Significance: Less than Significant.

Mitigation: None.

4.1.5 REFERENCES

Monterey County. 1982. *Monterey County General Plan and Amendments*. Adopted September 1982.

_____. 1985. *North County Area Plan and Amendments.* Adopted July 1985.

4.2 AIR QUALITY

4.2.1 INTRODUCTION

This section evaluates the potential air quality effects associated with the Proposed Project. This section: 1) describes the environmental setting, 2) identifies the regulatory environment, and 3) evaluates the Proposed Project's potential adverse environmental effects and identifies mitigation measures to reduce those effects, where necessary. This section is based on the following information:

- Denise Duffy & Associates, Inc. 2024. Updated CalEEMod Analysis for La Tourette Subdivision Project;
- Ambient Air Quality & Noise Consulting, 2018. Air Quality & Greenhouse Gas Impact Analysis for La Tourette Subdivision Project;
- Monterey Bay Air Resources District (as Monterey Bay Unified Air Pollution Control District), 2008. CEQA Air Quality Guidelines;
- Monterey Bay Air Resource District, 2016. Guidelines for Implementing the California Environmental Quality Act; and,
- Monterey Bay Air Resources District, 2017. 2012-2015 Air Quality Management Plan.

Table 4.2-1 summarizes the Proposed Project's anticipated environmental effects, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.2.5, Impacts and Mitigation Measures**.

Table 4.2-1
Summary of Air Quality Environmental Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measure	Residual Impact
AQ-1	The Project would not conflict with or obstruct implementation of any applicable air quality plan. Moreover, the Proposed Project would not violate any air quality standards or contribute substantially to an existing or projected air quality violation. The Proposed Project would not violate any air quality standards or contribute substantially to an existing or projected air quality violation.	Less than Significant	None	Less than Significant
AQ-2	The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).	Less than Significant	None	Less than Significant
AQ-3	The Project would not expose sensitive receptors to substantial pollutant concentrations.	Less than Significant	None	Less than Significant
AQ-4	The Project would not create objectionable odors affecting a substantial number of people.	Less than Significant	None	Less than Significant

4.2.2 ENVIRONMENTAL SETTING

4.2.2.1 Topography

The Proposed Project is in the North Central Coast Air Basin ("NCCAB"), which encompasses Santa Cruz, San Benito, and Monterey counties. The NCCAB includes an area of approximately 5,159 square miles along the central coast of California. The Diablo Range generally bounds the NCCAB to the northeast, which, together with the southern portion of the Santa Cruz Mountains, forms the Santa Clara Valley, extending into the northeastern tip of the NCCAB. Further south, the Santa Clara Valley transitions into the San Benito Valley, which runs northwest-southeast and has the Gabilan Range as its western boundary. To the west of the Gabilan Range is the Salinas Valley which extends from Salinas at the northwest end to King City at the southeast end. The Santa Cruz Mountains dominate the northwest portion of the NCCAB.

4.2.2.2 Meteorology and Climate

A semi-permanent high-pressure cell over the Pacific Ocean dominates the NCCAB climate. In the summer, the dominant high-pressure cell results in persistent west and northwest winds across the majority of coastal California. As the air descends in the Pacific high-pressure cell, a stable temperature inversion is formed. As temperatures increase, the warmer air aloft expands, forcing the coastal layer of air to move onshore, producing a moderate sea breeze over the coastal plains and valleys. Temperature inversions inhibit vertical air movement and often result in increased transport of air pollutants to inland receptor areas.

In the winter, when the high-pressure cell is weakest and farthest south, the inversion associated with the Pacific high-pressure cell is typically absent in the NCCAB. Air frequently flows in a southeasterly direction out of the Salinas and San Benito valleys in the NCCAB. During this time of year, the predominant offshore flow tends to aid in pollutant dispersal, producing relatively healthful to moderate air quality throughout the majority of the region. Conditions during this time are often characterized by afternoon and evening land breezes and occasional rainstorms. However, local inversions caused by air cooling close to the ground can form in some areas during the evening and early morning hours.

Winter daytime temperatures in the NCCAB typically average in the mid-50s with nighttime temperatures averaging in the low 40s. Summer daytime temperatures typically average in the 60s with nighttime temperatures averaging in the 50s. Precipitation varies within the region, but annual rainfall is generally lowest in the coastal plain and inland valley, higher in the foothills, and highest in the mountains.

4.2.2.3 Criteria Pollutants

The Federal Clean Air Act ("FCAA") requires that the United States Environmental Protection Agency ("U.S. EPA") establish National Ambient Air Quality Standards ("NAAQS") for various pollutants. These pollutants are referred to as "criteria" pollutants because the U.S. EPA publishes criteria documents to justify the choice of standards. These standards define the maximum amount of an air pollutant that can be present in ambient air. An ambient air quality standard is generally specified as a concentration averaged over a specific time period, such as one hour, eight hours, 24 hours, or one year. The different averaging times and concentrations are meant to protect against different exposure effects. Standards established for the protection of human health are referred to as primary standards; whereas standards established for the prevention of environmental and property damage are called secondary standards.

The following discussion provides a summary of the primary and secondary criteria air pollutants of primary concern. In general, primary pollutants are directly emitted into the atmosphere, and chemical reactions in the atmosphere form secondary pollutants.

Ozone ("O_3") is a reactive gas consisting of three (3) atoms of oxygen. It is a colorless gas with a pungent odor. It is a secondary pollutant that is formed when oxides of Nitrogen ("NO_X") and volatile organic compounds ("VOC"), also referred to as reactive organic gases ("ROG") react in the presence of sunlight. Ozone at the earth's surface causes numerous adverse health effects (e.g., respiratory ailments and cardiovascular disease).

Oxides of Nitrogen ("NO_X") are a family of gaseous nitrogen compounds and are precursors to the formation of ozone and particulate matter. The major component of NO_X, nitrogen dioxide ("NO_2"), is a reddish-brown gas that is toxic at high concentrations. NO_X results primarily from the combustion of fossil fuels under high temperatures and pressure. On-road and off-road motor vehicles and fuel combustion are the major sources of this air pollutant.

Particulate Matter ("PM"), also known as particle pollution, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of several components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. U.S. EPA is concerned about particles 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. U.S. EPA groups particle pollution based on their size and where they are deposited:

- Inhalable coarse particles ($PM_{2.5}$- PM_{10}), such as those found near roadways and dusty industries, are between 2.5 and 10 micrometers in diameter. $PM_{2.5-10}$ is deposited in the thoracic region of the lungs.
- Fine particles ($PM_{2.5}$), such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air. They penetrate deeply into the thoracic and alveolar regions of the lungs.

Carbon Monoxide ("CO") is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels and is emitted directly into the air. The main source of CO is on-road motor vehicles. Other CO sources include other mobile sources, miscellaneous processes, and fuel combustion from stationary sources. Because of the local nature of CO problems, ARB and U.S. EPA designate urban areas as CO nonattainment areas instead of the entire basin as with ozone and PM_{10}.

Sulfur Dioxide ("SO_2") is a colorless, irritating gas with a "rotten egg" smell formed primarily by the combustion of sulfur-containing fossil fuels. When suspended in the air SO_X particles contribute to poor visibility. When SO_2 combines with other pollutants $PM_{2.5}$ is created.

Lead ("Pb") is a metal that is a natural constituent of air, water, and the biosphere. The health effects of lead poisoning include loss of appetite, weakness, apathy, and miscarriage. Lead can also cause lesions of the neuromuscular system, circulatory system, brain, and gastrointestinal tract. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels. The use of leaded fuel has been mostly phased out, which has resulted in a reduction of ambient concentrations of lead.

Other Pollutants. The State of California has established air quality standards for some pollutants not addressed by Federal standards. The California Air Resources Board ("CARB") has established State standards for hydrogen sulfide, sulfates, vinyl chloride, and visibility reducing particles.

4.2.2.4 Odors

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

The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals can smell very minute quantities of specific substances; others may not have the same sensitivity but may be sensitive to other substances' odors. In addition, people may have different reactions to the same odor. In fact, an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also 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 describes the odor's quality. 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 detecting or recognizing 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.

Neither the state nor the federal governments have adopted rules or regulations for the control of odor sources. The Monterey Bay Air Resources District ("MBARD") does not have an individual rule or regulation that specifically addresses odors; however, odors would be subject to MBARD *Rule 402, Nuisance.* Any actions related to odors would be based on citizen complaints to local governments and the MBARD.

4.2.2.5 Toxic Air Contaminants

Toxic air contaminants ("TACs") are air pollutants that may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air, but due to their high toxicity, they may pose a threat to public health even at very low concentrations. While state and federal governments have set standards and acceptable levels of exposure for criteria pollutants, TACs have no threshold level for which adverse health impacts would not occur. Therefore, TACs are not considered "criteria pollutants" under either the FCAA or the California Clean Air Act ("CCAA"). As a result, TACs are not subject to National or California ambient air quality standards ("NAAQS" and "CAAQS," respectively). Instead, the U.S. EPA and the CARB regulate Hazardous Air Pollutants ("HAPs") and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology to limit emissions. In conjunction with MBARD rules, these federal and state statutes and regulations establish the regulatory framework for TACs. At the national level, the U.S. EPA has established National Emission Standards for HAPs ("NESHAPs") in accordance with the

requirements of the FCAA and subsequent amendments. These are technology-based source-specific regulations that limit allowable emissions of HAPs.

Within California, TACs are regulated 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 ARB to designate substances as TACs. **Table 4.2-2** provides a summary of the primary TACs of concern within the State of California and related health effects.

Table 4.2-2
Toxic Air Contaminants

Pollutant	Designation	Health Effects	Major Sources
Diesel Particulate Matter ("DPM")	DPM was identified as a TAC by the ARB in August 1998. DPM is emitted from both mobile and stationary sources.	Exposure to DPM can have immediate health effects. DPM can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, exposure to DPM also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. The elderly and people with emphysema, asthma and chronic heart and lung disease are especially sensitive to fine-particle pollution. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can also reduce lung function in children. In California, DPM has been identified as a carcinogen.	DPM is emitted from both mobile and stationary sources. In California, on-road diesel-fueled vehicles contribute approximately 40 percent of the statewide total, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources, contributing about 3 percent of emissions, include shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations. Emissions from these sources are from diesel-fueled internal combustion engines. Stationary sources that report DPM emissions include heavy construction, asphalt paving materials and blocks, and diesel-fueled electrical generation facilities (ARB 2013).
Acetaldehyde	Acetaldehyde is a federal hazardous air pollutant. The CARB identified acetaldehyde as a TAC in April 1993.	Acute exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic intoxication of acetaldehyde resemble those of alcoholism. The U.S. EPA has classified acetaldehyde as a probable human carcinogen. In California, acetaldehyde was classified on April 1, 1988, as a chemical known to the state to cause cancer (U.S. EPA 2018a; CARB 2013).	Acetaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Sources of acetaldehyde include emissions from combustion processes such as exhaust from mobile sources and fuel combustion from stationary internal combustion engines, boilers, and process heaters. A majority of the statewide acetaldehyde emissions can be attributed to mobile sources, including on-road motor vehicles, construction and mining equipment, aircraft, recreational boats, and agricultural equipment. Area sources of emissions include the burning of wood in residential fireplaces and wood stoves. The primary stationary sources of acetaldehyde are from fuel combustion from the petroleum industry (CARB 2013).

Pollutant	Designation	Health Effects	Major Sources
Benzene	Benzene is highly carcinogenic and occurs throughout California. The CARB identified benzene as a TAC in January 1985.	Acute inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidences of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. The U.S. EPA has classified benzene as a known human carcinogen for all routes of exposure (U.S. EPA 2018a).	A majority of benzene emitted in California (roughly 88 percent) comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. These sources include on-road motor vehicles, recreational boats, off-road recreational vehicles, and lawn and garden equipment. Benzene is also formed as a partial combustion product of larger aromatic fuel components. To a lesser extent, industry-related stationary sources are also sources of benzene emissions. The primary stationary sources of reported benzene emissions are crude petroleum and natural gas mining, petroleum refining, and electric generation that involves the use of petroleum products. The primary area sources include residential combustion of various types such as cooking and water heating (CARB 2013).
1,3-butadiene	1,3-butadiene was identified by the CARB as a TAC in 1992.	Acute exposure to 1,3-butadiene by inhalation in humans results in irritation of the eyes, nasal passages, throat, and lungs. Epidemiological studies have reported a possible association between 1,3-butadiene exposure and cardiovascular diseases. Epidemiological studies of workers in rubber plants have shown an association between 1,3-butadiene exposure and increased incidence of leukemia. Animal studies have reported tumors at various sites from 1,3-butadiene exposure. In California, 1,3-butadiene has been identified as a carcinogen.	Most of the emissions of 1,3-butadiene are from incomplete combustion of gasoline and diesel fuels. Mobile sources account for a majority of the total statewide emissions. Additional sources include agricultural waste burning, open burning associated with forest management, petroleum refining, manufacturing of synthetics and manmade materials, and oil and gas extraction. The primary natural sources of 1,3-butadiene emissions are wildfires (CARB 2013).
Carbon Tetrachloride	Carbon Tetrachloride was identified by the ARB as a TAC in 1987 under California's TAC program (CARB 2013).	The primary effects of carbon tetrachloride in humans are on the liver, kidneys, and central nervous system. Human symptoms of acute inhalation and oral exposures to carbon tetrachloride include headache, weakness, lethargy, nausea, and vomiting. Acute exposures to higher levels and chronic (long-term) inhalation or oral exposure to carbon tetrachloride produces liver and kidney damage in humans. Human data on the carcinogenic effects of carbon tetrachloride are limited. Studies in animals have shown that ingestion of carbon tetrachloride increases the risk of liver cancer. In California, carbon tetrachloride has been identified as a carcinogen.	The primary stationary sources reporting emissions of carbon tetrachloride include chemical and allied product manufacturers and petroleum refineries. In the past, carbon tetrachloride was used for dry cleaning and as a grain-fumigant. Usage for these purposes is no longer allowed in the United States. Carbon tetrachloride has not been registered for pesticidal use in California since 1987. Also, the use of carbon tetrachloride in products to be used indoors has been discontinued in the United States. The statewide emissions of carbon tetrachloride are small (about 1.96 tons per year), and background concentrations account for most of the health risk (CARB 2013).

Pollutant	Designation	Health Effects	Major Sources
Hexavalent chromium	Hexavalent chromium was identified as a TAC in 1986.	The respiratory tract is the major target organ for hexavalent chromium toxicity, for acute and chronic inhalation exposures. Shortness of breath, coughing, and wheezing were reported from a case of acute exposure to hexavalent chromium, while perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, and other respiratory effects have been noted from chronic exposure. Human studies have clearly established that inhaled hexavalent chromium is a human carcinogen, resulting in an increased risk of lung cancer. In California, hexavalent chromium has been identified as a carcinogen.	Sources of Hexavalent chromium include industrial metal finishing processes, such as chrome plating and chromic acid anodizing, and firebrick lining of glass furnaces. Other sources include mobile sources, including gasoline motor vehicles, trains, and ships (CARB 2013).
Para-Dichlorobenzene	Para-Dichlorobenzene was identified by the CARB as a TAC in April 1993.	Acute exposure to paradichlorobenzene via inhalation results in irritation to the eyes, skin, and throat in humans. In addition, long-term inhalation exposure may affect the liver, skin, and central nervous system in humans. The U.S. EPA has classified para-dichlorobenzene as a possible human carcinogen.	The primary area-wide sources that have reported emissions of para-dichlorobenzene include consumer products such as non-aerosol insect repellants and solid/gel air fresheners. These sources contribute nearly all of the statewide para-dichlorobenzene emissions (CARB 2013).
Formaldehyde	Formaldehyde was identified by the CARB as a TAC in 1992.	Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute and chronic inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. Formaldehyde is classified as a probable human carcinogen.	Formaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Photochemical oxidation is the largest source of formaldehyde concentrations in California ambient air. Directly emitted formaldehyde is a product of incomplete combustion. One of the primary sources of directly-emitted formaldehyde is vehicular exhaust. Formaldehyde is also used in resins, can be found in many consumer products as an antimicrobial agent, and is also used in fumigants and soil disinfectants. The primary area sources of formaldehyde emissions include wood burning in residential fireplaces and wood stoves (CARB 2013).

Pollutant	Designation	Health Effects	Major Sources
Methylene Chloride	Methylene Chloride was identified by the CARB as a TAC in 1987.	The acute effects of methylene chloride inhalation in humans consist mainly of nervous system effects including decreased visual, auditory, and motor functions, but these effects are reversible once exposure ceases. The effects of chronic exposure to methylene chloride suggest that the central nervous system is a potential target in humans and animals. Human data are inconclusive regarding methylene chloride and cancer. Animal studies have shown increases in liver and lung cancer and benign mammary gland tumors following the inhalation of methylene chloride. In California, methylene chloride has been identified as a carcinogen.	Methylene chloride is used as a solvent, a blowing and cleaning agent in the manufacture of polyurethane foam and plastic fabrication, and as a solvent in paint stripping operations. Paint removers account for the largest use of methylene chloride in California, where methylene chloride is the main ingredient in many paint stripping formulations. Plastic product manufacturers, manufacturers of synthetics, and aircraft and parts manufacturers are stationary sources reporting emissions of methylene chloride (CARB 2013).
Perchloroethylene	Perchloroethylene was identified by the CARB as a TAC in 1991.	Acute inhalation exposure to perchloroethylene vapors can result in irritation of the upper respiratory tract and eyes, kidney dysfunction, and at lower concentrations, neurological effects, such as reversible mood and behavioral changes, impairment of coordination, dizziness, headaches sleepiness, and unconsciousness. Chronic inhalation exposure can result in neurological effects, including sensory symptoms such as headaches, impairments in cognitive and motor neurobehavioral functioning, and color vision decrements. Cardiac arrhythmia, liver damage, and possible kidney damage may also occur. In California, perchloroethylene has been identified as a carcinogen.	Perchloroethylene is used as a solvent, primarily in dry cleaning operations. Perchloroethylene is also used in degreasing operations, paints and coatings, adhesives, aerosols, specialty chemical production, printing inks, silicones, rug shampoos, and laboratory solvents. In California, the stationary sources that have reported emissions of perchloroethylene are dry cleaning plants, aircraft part and equipment manufacturers, and fabricated metal product manufacturers. The primary area sources include consumer products such as automotive brake cleaners and tire sealants and inflators (CARB 2013).

4.2.2.6 Asbestos

Asbestos is a term used for several naturally occurring fibrous minerals found in many parts of California. The most common type of asbestos is chrysotile, but other types are also found in California. Serpentine rock often contains chrysotile asbestos. Serpentine rock, and its parent material, ultramafic rock, is abundant in the Sierra foothills, the Klamath Mountains, and Coast Ranges. The Project site, however, is not located in an area of known ultramafic rock.

Asbestos is commonly found in ultramafic rock, including serpentine, and near fault zones. The amount of asbestos typically present in these rocks ranges from less than 1 percent up to about 25 percent, and sometimes more. Asbestos is released from ultramafic and serpentine rock when it is broken or crushed. This can happen when cars drive over unpaved roads or driveways which are surfaced with these rocks, when land is graded for building purposes, or at quarrying operations. It is also released naturally through weathering and erosion. Once released from the rock, asbestos can become airborne and may stay in the air for long periods of time.

Additional sources of asbestos include building materials and other manmade materials. The most common sources are heat-resistant insulators, cement, furnace or pipe coverings, inert filler material, fireproof gloves

and clothing, and brake linings. Asbestos has been used in the United States since the early 1900's; however, asbestos is no longer allowed as a constituent in most home products and materials. Many older buildings, schools, and homes still have asbestos-containing products.

CARB identified naturally-occurring asbestos as a TAC in 1986. The CARB has adopted two statewide control measures that prohibit the use of serpentine or ultramafic rock for unpaved surfacing and control dust emissions from construction, grading, and surface mining in areas with these rocks. Various other laws have also been adopted, including laws related to the control of asbestos-containing materials during the renovation and demolition of buildings.

All types of asbestos are hazardous and may cause lung disease and cancer. Health risks to people are dependent upon their exposure to asbestos. The longer a person is exposed and the greater the intensity of the exposure, the greater the chances for a health problem. Asbestos-related diseases, such as lung cancer, may not occur for decades after breathing asbestos fibers. Cigarette smoking increases the risk of lung cancer from asbestos exposure.

4.2.2.7 Attainment and Ambient Air Quality

The attainment status of the NCCAB is summarized in **Table 4.2-3**. An attainment designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A nonattainment designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation(s) was caused by an exceptional event, as defined in the criteria. Unclassified designations indicate insufficient data is available to determine attainment status.

Table 4.2-3
NCCAB Attainment Status Designations

Pollutant	State Designation[1]	National Designation[2,3]
Ozone (O_3)	Nonattainment[2]	Attainment/Unclassified[3]
Inhalable Particulates (PM_{10})	Nonattainment	Attainment
Fine Particulate ($PM_{2.5}$)	Attainment	Attainment/Unclassified[4]
Carbon Monoxide (CO)	Monterey County - Attainment Santa Cruz County - Unclassified San Benito County - Unclassified	Attainment/Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Attainment/Unclassified[5]
Sulfur Dioxide (SO_2)	Attainment	Attainment[6]
Lead	Attainment	Attainment/Unclassified[7]

Notes:
1) State designations based on 2010 to 2012 air monitoring data.
2) Effective July 26, 2007, the ARB designated the NCCAB a nonattainment area for the State ozone standard, which was revised in 2006 to include an 8-hour standard of 0.070 ppm.
3) On March 12, 2008, EPA adopted a new 8-hour ozone standard of 0.075 ppm. In April 2012, EPA designated the NCCAB attainment/unclassified based on 2009-2011 data.
4) This includes the 2006 24-hour standard of 35 µg/m3 and the 2012 annual standard of 12 µg/m3.
5) In 2012, EPA designated the entire state as attainment/unclassified for the 2010 NO2 standard.
6) In June 2011, the ARB recommended to EPA that the entire state be designated as attainment for the 2010 primary SO2 standard. Final designations to be addressed in future EPA actions.
7) On October 15, 2008 EPA lowered the NAAQS for lead to 0.15 µg/m3. Final designations were made by EPA in November 2011.
Source: ARB 2018b, MBARD 2018a.Source: MBARD, 2017. Air Quality Management Plan (mbard.org)

Several monitoring stations measure air pollutant concentrations in Monterey County. The "Salinas #3 Monitoring Station" is the closest representative monitoring site to the Proposed Project with sufficient data to meet U.S. EPA and/or ARB criteria for quality assurance. This monitoring station monitors ambient concentrations of ozone, NO_2, CO, and $PM_{2.5}$. Ambient monitoring data for the last three (3) years of available measurement data (i.e., 2018 through 2020) are summarized in **Table 4.2-4**. As shown below, state, and federal standards for ozone, NO_2, CO, and $PM_{2.5}$ have not been exceeded during the past three (3) years.

Table 4.2-4
Summary of Ambient Air Quality Monitoring Data[1]

Condition	Pollutant	2018	2019	2020
Maximum concentration, ppm (1-hour/8-hour average)	Ozone	0.089/0.52	0.072/0.064	0.073/0.057
Number of days state/national 1-hour standard exceeded	Ozone	0/0	0/0	0/0
Number of days state/national 8-hour standard exceeded	Ozone	0/0	0/0	0/0
Maximum concentration, ppm (1-hour average)	Nitrogen Dioxide (NO_2)	38.0	33.0	33.0
Annual average	Nitrogen Dioxide (NO_2)	5	5	4
Number of days state/national standard exceeded	Nitrogen Dioxide (NO_2)	0/0	0/0	0/0
Maximum concentration, ppm (1-hour/8-hour average)	Carbon Monoxide (CO)[2]	1.8/1.1	1.6/0.9	4.2/0.9
Number of days state/national 1-hour standard exceeded	Carbon Monoxide (CO)[2]	0	0	0
Number of days state/national 8-hour standard exceeded	Carbon Monoxide (CO)[2]	0	0	0
Maximum concentration, $\mu g/m^3$ (state/national)	Suspended Particulate Matter ($PM_{2.5}$)	20.2	22.8	28.7
Annual Average	Suspended Particulate Matter ($PM_{2.5}$)	6.1	4.1	6.8
Number of days national standard exceeded (measured/calculated)[3]	Suspended Particulate Matter ($PM_{2.5}$)	5/0	1/0	9/0

Notes:
ppm = parts per million by volume, µg/m3 = micrograms per cubic meter
1. Ambient data was obtained from the Salinas #3 Monitoring Station.
2. Based on data derived from U.S. EPA Monitor Values Report (2018b).
3. Measured days are those days that an actual measurement was greater than the standard. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day.
Source: CARB, 2021

4.2.2.8 Sensitive Receptors

Air quality standards are important for protecting members of the public who are sensitive to the adverse health effects as a result of air pollution. These individuals are termed "sensitive receptors." The term sensitive receptors refer to specific population groups and the land uses where individuals would reside for long periods.

Commonly identified sensitive population groups include children, the elderly, the acutely ill, and the chronically ill. Commonly identified sensitive land uses include facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Residential dwellings, schools, parks, playgrounds, childcare centers, convalescent homes, and hospitals are examples of sensitive land uses.

Nearby sensitive receptors consist of rural residential dwellings. These receptors are existing residences on the Project site and would be demolished as part of the project. The next nearest receptor is approximately 700 feet south of the center of the Project site.

4.2.3 REGULATORY ENVIRONMENT

4.2.3.1 Federal

U.S. Environmental Protection Agency. At the federal level, the U.S. EPA has been charged with implementing national air quality programs. The U.S. EPA's air quality mandates are drawn primarily from the FCAA, which was signed into law in 1970. Congress substantially amended the FCAA in 1977 and again in 1990.

Federal Clean Air Act. The FCAA required the U.S. EPA to establish NAAQS, and also set deadlines for their attainment. Two (2) types of NAAQS have been established: primary standards, which protect public health, and secondary standards, which protect public welfare from non-health-related adverse effects, such as visibility restrictions. The FCAA allows states to adopt additional or more health-protective standards. **Table 4.2-5** summarizes the California Ambient Air Quality Standards and the NAAQS.

Table 4.2-5
Summary of Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard*	National Standards (Primary)
Ozone	1-Hour	0.09 ppm	- -
Ozone	8-Hour	0.07 ppm	0.070 ppm
PM_{10}	AAM	20 μg/m^3	- -
PM_{10}	24-Hour	50 μg/m^3	150 μg/m^3
$PM_{2.5}$	AAM	12 μg/m^3	12 μg/m^3
$PM_{2.5}$	24-Hour	No standard	35 μg/m^3
Carbon Monoxide	1-Hour	20 ppm	35 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9 ppm
Nitrogen Dioxide	AAM	0.030 ppm	0.053 ppm
Nitrogen Dioxide	1-Hour	0.18 ppm	100 ppm
Sulfur Dioxide	AAM	- -	0.03 ppm
Sulfur Dioxide	24-Hour	0.04 ppm	0.14 ppm
Sulfur Dioxide	3-Hour	- -	0.5 ppm (1300 μg/m^3)**
Sulfur Dioxide	1-Hour	0.25 ppm	75 ppm
Lead	30- day	1.5 μg/m^3	- -
Lead	Calendar quarter	- -	1.5 μg/m^3
Lead	Rolling 3-month	- -	0.15 μg/m^3
Sulfate	24-Hour	25 μg/m3	No Federal Standards
Hydrogen Sulfide	1-Hour	0.03 ppm (42 μg/m^3)	No Federal Standards
Vinyl Chloride	24-Hour	0.01 ppm (26 μg/m^3)	No Federal Standards

Pollutant	Averaging Time	California Standard*	National Standards (Primary)
Visibility Reducing Particles	8-hours	Extinction coefficient of 0.23 per kilometer —visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is < 70%.	No Federal Standards

Source: https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf (September 30, 2021)
ppm = Parts per Million; µg/m3 = Micrograms per Cubic Meter; AMM = Annual Arithmetic Mean
* For more information on standards visit :http//www.arb.ca.gov.research/aaqs/aaqs2.pdf
**Secondary Standard
Source: ARB 2018c

The FCAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan ("SIP"). The 1990 FCAA Amendments required states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. The U.S. EPA has the responsibility to review all state SIPs to determine conformance with the mandates of the FCAA, and the amendments thereof, and determine if implementation will achieve air quality goals. If the U.S. EPA determines a SIP to be inadequate, a Federal Implementation Plan ("FIP") may be prepared for the nonattainment area that imposes additional control measures.

Pursuant to CCAA and CCAA amendments, a region must participate in the SIP if it is designated as a maintenance region. The most recent Federal Plan prepared by MBARD to maintain the 1-hour ozone NAAQS is the 2007 Federal Maintenance Plan for Maintaining the National Ozone Standard in the Monterey Bay Region and adopted rules and regulations.[1]

4.2.3.2 State

California Air Resources Board. The CARB is the agency responsible for coordinating and overseeing state and local air pollution control programs in California and implementing the CCAA of 1988. Other CARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control districts and air quality management districts, establishing CAAQS, which in many cases are more stringent than the NAAQS, and setting emissions standards for new motor vehicles[2]. The CAAQS are summarized in **Table 4.2-5** above.

California Clean Air Act. The CCAA requires that all air districts in the state endeavor to achieve and maintain CAAQS for Ozone, CO, SO_2, and NO_2 by the earliest practical date. The CCAA specifies that districts focus particular attention on reducing the emissions from transportation and area-wide emission sources, and the act provides districts with authority to regulate indirect sources. Each district plan is required to either (1) achieve a five (5) percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors, or (2) provide for the implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both state and federal planning requirements.

[2] The emission standards established for motor vehicles differ depending on various factors including the model year, and the type of vehicle, fuel, and engine used.

Assembly Bills 1807 & 2588 - Toxic Air Contaminants. Within California, TACs are regulated primarily through AB 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics Hot Spots Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB designates a substance as a TAC. Existing sources of TACs that are subject to the Air Toxics Hot Spots Information and Assessment Act are required to: (1) prepare a toxic emissions inventory; (2) prepare a risk assessment if emissions are significant; (3) notify the public of significant risk levels; and (4) prepare and implement risk reduction measures.

California Building Standards Code. The California Building Standards Code ("CBSC"), commonly referred to as Title 24, contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The CBSC includes energy efficiency standards, which are commonly referred to as green building standards or CalGreen standards. The CBSC is adopted every three years by the Building Standards Commission ("BSC"). In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBSC was most recently updated in 2019.

4.2.3.3 Local

Monterey Bay Air Resources District. The MBARD is the agency primarily responsible for ensuring that NAAQS and CAAQS are not exceeded and that air quality conditions are maintained in the NCCAB. Responsibilities of the MBARD include, but are not limited to, preparing plans for the attainment of ambient air quality standards, adopting, and enforcing rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing programs and regulations required by the FCAA and the CCAA. In an attempt to achieve NAAQS and CAAQS and maintain air quality, the MBARD has most recently completed the *2012-2015 Air Quality Management Plan ("AQMP")* for achieving the state ozone standards and the *2007 Federal Maintenance Plan* for maintaining federal ozone standards (MBARD 2017).

To achieve and maintain ambient air quality standards, the MBARD has adopted various rules and regulations for the control of airborne pollutants. The MBARD rules and regulations that are applicable to the proposed project include, but are not limited to, the following:

- **Rule 402 (Nuisances).** The purpose of this rule is to prohibit emissions that may create a public nuisance. Applies to any source operation that emits or may emit air contaminants or other materials.
- **Rule 426 (Architectural Coatings).** The purpose of this rule is to limit emissions of volatile organic compounds from architectural coatings.
- **Rule 425 (Use of Cutback Asphalt).** The purpose of this rule is to limit emissions of vapors of organic compounds from the use of cutback and emulsified asphalt. This rule applies to the manufacture and use of cutback, slow cure, and emulsified asphalt during paving and maintenance operations.
- **Rule 424 (NESHAP-Asbestos).** Rule 424 adopts the National Emissions Standards for Hazardous Air Pollutants contained in the Code of Federal Regulations (40 CFR Part 61) pertaining to asbestos removal and building demolitions.

County of Monterey 1982 General Plan. The County of Monterey General Plan provides policies for the protection of people from air quality hazards. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing** for a detailed analysis of the Project's consistency with applicable air quality policies. Relevant policies are listed below:

20.1.1 The County's land use and development policies shall be integrated and consistent with the natural limitations of the County's air basins.

20.1.2 The County should encourage the use of mass transit, bicycles, and pedestrian modes of transportation as an alternative to automobiles in its land use plans.

20.1.3 The County should develop and implement, where appropriate, a roadside tree program and should encourage and maintain vegetated/forested areas to the maximum extent feasible, for their air purifying functions.

20.2.2 The County shall adopt and support, as a minimum, the Air Quality Plan for the Monterey Bay Region as prepared by the Association of Monterey Bay Area Governments.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The NCAP does not include any air quality policies that are applicable to the Proposed Project.

4.2.4 IMPACTS AND MITIGATION MEASURES

4.2.4.1 Thresholds of Significance

A project impact would be considered significant if the Project would:

a. Conflict with or obstruct implementation of the applicable air quality plan;

b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard;

c. Expose sensitive receptors to substantial pollutant concentrations; or,

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

The MBARD provides guidance to evaluating the potential air quality effects associated with new development (see *CEQA Air Quality Guidelines* (MBARD 2008) and *Guidelines for Implementing the California Environmental Quality Act* (MBARD 2016)). The MBARD's 2008 and 2016 Guidelines include recommended thresholds of significance for short-term construction, long-term operational, odor, toxic air contaminant, and cumulative air quality impacts. The following analysis relies on the following MBARD-recommended thresholds of significance to determine the significance of project-related effects:

- **Short-term Emissions of Criteria Air Pollutants**. Construction impacts would be significant if the Proposed Project would emit greater than 82 pounds per day (lbs/day) of PM_{10}, or would cause a

violation of PM_{10} National or State AAQS at nearby receptors. Construction-generated emissions of ozone precursors (i.e., ROG or NO_X) are accommodated in the emission inventories of state and federally-required air plans. For this reason, the MBARD has not identified recommended thresholds of significance for construction-generated ozone precursors.

- **Long-Term Emissions of Criteria Air Pollutants**. Operational impacts would be considered potentially significant if direct and indirect emissions would exceed 137 lbs/day of either ROG or NO_X, 82 lbs/day of PM_{10}, or if the Project would contribute to local PM_{10} concentrations that exceed Ambient Air Quality Standards. Emissions of SO_X would be significant if the Project generates direct emissions of greater than 150 lbs/day.
- **Local Mobile-Source CO Concentrations**. Local mobile-source impacts would be significant if the Project generates direct emissions of greater than 550 lbs/day of CO or would contribute to local CO concentrations exceeding the CAAQS of 9.0 ppm for 8 hours or 20 ppm for 1 hour. Indirect emissions are typically considered to include mobile sources that access the Project site but generally emit off-site; direct emissions typically include sources that are emitted onsite (e.g., stationary sources, onsite mobile equipment).
- **Toxic Air Contaminants**. TAC impacts would be significant if the Project would expose the public to substantial levels of TACs so that the probability of contracting cancer for the maximally exposed individual would exceed 10 in 1 million and/or so that ground-level concentrations of non-carcinogenic toxic air contaminants would result in a Hazard Index greater than 1 for the maximally exposed individual.
- **Odorous Emissions**. Odor impacts would be significant if the Project has the potential to frequently expose members of the public to objectionable odors.

4.2.4.2 Methodology

Short-term Construction. Ambient Air Quality & Noise Consulting, Inc. ("Ambient") quantified short-term emissions using the California Emissions Estimator Model ("CalEEMod"), version 2016.3.2. The analysis used a one-year construction period. Ambient's approach included an estimated 6,500 square feet of demolition of existing structures and a total of approximately 11,100 cubic yards of imported soil Modeling assumptions, including off-road equipment usage, worker and vendor vehicle trips, trips distances, and fleet mix were based mainly on model defaults for Monterey County. Additionally, Ambient amortized construction-generated GHGs over an estimated 30-year project life. Ambient included the amortized GHG emissions with operational emissions to evaluate potential impacts. Please refer to **Appendix B** for emissions modeling assumptions and results. Ambient qualitatively evaluated localized air quality impacts. In 2024, the Applicant provided updated grading plans that identified approximately 9,220 cubic yards of cut and 6,410 cubic yards of fill for rough grading of the proposed building envelopes, construction of an access road, and other infrastructure. An additional 1,200 cubic yards may be required for the improvements to the external access road. An updated CalEEMod analysis (version 2022.1.1.28) was prepared utilizing the same modeling assumptions as Ambient's analysis. The CalEEMod update is available as an attachment to **Appendix B**.

Long-term Operation. Ambient quantified long-term emissions using CalEEMod, version 2016.3.2, assuming a total of 19 single-family residential dwelling units. Ambient derived vehicle trip-generation rates from the traffic analysis prepared for this Project. Ambient adjusted the energy intensity factors to reflect compliance with Renewable Portfolio Standards requirements. Ambient also assumed the proposed residential dwellings

would include installation of solar photovoltaic systems, low-flow water fixtures, water-efficient irrigation systems, energy-efficient lighting, and appliances, in compliance with current and anticipated construction year building code requirements. At a minimum, the solar photovoltaic systems would provide 20 percent of the estimated electrical demand. Other modeling assumptions, including energy and water usage rates, waste-generation rates, vehicle trip distances, and vehicle fleet mix were based on CalEEMod model defaults for Monterey County. Ambient assumed a 2020 build-out, and therefore, emission post-2020 would be reduced as a result of reduced future-year energy usage and vehicle emission factors. As noted previously, revised grading estimates required an update to the CalEEMod analysis, therefore the buildout was updated to reflect a 2026 completion. Ambient quantified operational GHG emissions for years 2020 and 2030 to coincide with the state's GHG-reduction target years.[3] Refer to **Appendix B** for emissions modeling assumptions and results. Ambient qualitatively evaluated localized air quality impacts.

4.2.4.3 Impact Analysis

Impact AQ-1: The Project would not conflict with or obstruct implementation of any applicable air quality plan. Moreover, the Proposed Project would not violate any air quality standards or contribute substantially to an existing or projected air quality violation. The Proposed Project would not violate any air quality standards or contribute substantially to an existing or projected air quality violation. This represents a less than significant impact. No mitigation measures are warranted. (Criterion a).

CEQA Guidelines Sec. 15125(b) requires that an EIR evaluate a project's consistency with applicable regional plans, in this instance the 2012-2015 Air Quality Management Plan ("AQMP"). MBARD issues consistency determinations to assess the potential cumulative impacts of development on regional air quality. Project emissions which are not consistent with the AQMP are not accommodated in the AQMP and would represent a potentially significant impact for the purposes of CEQA. Furthermore, vehicle miles travelled as a result of population, employment, or regional growth may conflict or obstruct implementation of the AQMP. MBARD utilizes dwelling units to determine consistency with the AQMP, due to the close relationship with population and the ability to track housing stock.

The Proposed Project would not conflict with or obstruct implementation of the 2012-2015 Air Quality Management Plan ("AQMP"). Consistency with the AQMP is assessed by comparing the potential growth associated with a project with the population and dwelling unit forecasts adopted by the Association of Monterey Bay Area Governments ("AMBAG"). These projections are used to generate emission forecasts upon which the AQMP is based. Project's which are consistent with AMBAG's regional forecasts would be considered consistent with the AQMP. Projects that would result in a significant increase in air quality emissions beyond the MBARD significance thresholds would potentially conflict with or obstruct implementation of the AQMP.

As discussed in **Chapter 5, CEQA Considerations**, the existing population of unincorporated Monterey County as of (Census, 2020) is 439,035, more specifically the Prunedale area's exiting population (Census, 2020) is 18,885, with the average household size of 3.23 (County of Monterey, 2016). The Proposed Project would construct 16 new single family residential units, that would accommodate approximately 51 new people. This addition to the population represents 0.002% of the existing Prunedale population (Census, 2020), which would

[3] The updated CalEEMod analysis for GHG emissions for 2025.

not be considered significant in terms of number of dwelling units or population. MBARD previously reviewed the project in 2006 and determined it was consistent with the AQMP in effect at the time of the review (AMBAG, 2006). A copy of the 2006 consistency determination is included in **Appendix C.**

In addition, the Proposed Project would not result in a significant increase in emissions. The Proposed Project would not violate any air quality standards or contribute to existing or projected air quality violations. As discussed below (see **Impact AQ-2** and **Impact AQ-3**), the Proposed Project would not result in short-term or long-term increases in emissions that would violate any air quality standard or contribute to an existing or projected air quality violation. For a more detailed discussion of potential short-term and long-term air quality effects associated with the Project, please refer to the discussion contained in **Impact AQ-3** and **AQ-4**. Based on the analysis presented below, the Proposed Project is not anticipated to violate any air quality standard or represent a substantial increase in an existing or Project air quality violation. **As a result, this impact is considered less than significant. No mitigation measures are necessary.**

For the reasons provided above, implementation of the Proposed Project is not anticipated to result in a substantial increase in either direct or indirect emissions that would conflict with or obstruct implementation of the AQMP. **This represents a less than significant impact. No mitigation measures are necessary.**

Significance: Less than Significant.

Mitigation: None.

Impact AQ-2: The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). This represents a less than significant impact. No mitigation measures are warranted. (Criterion b).

Construction

The Proposed Project would not result in a cumulatively considerable net increase in any criteria pollutant during project construction. Construction-generated emissions are short-term and of temporary duration. The construction of the Proposed Project would result in the temporary generation of emissions resulting from site grading and excavation, asphalt paving, the application of architectural coatings, motor vehicle exhaust associated with construction equipment and on-road vehicle trips. Emissions of PM are largely associated with ground disturbance and the movement of construction vehicles and equipment on unpaved surfaces. For the purposes of this analysis, construction impacts would be significant if the Proposed Project would emit greater than 82 pounds per day (lbs/day) of PM_{10}, or would cause a violation of PM_{10} National or State AAQS at nearby receptors.

Table 4.2-6 summarizes the construction-generated emissions associated with the Proposed Project. The Proposed Project would generate maximum daily PM_{10} emissions of approximately 58.9 lbs/day. Emissions of particulate matter would largely occur during the site preparation and grading activities. Construction activities would not generate PM_{10} emissions that would exceed the MBARD's significance threshold of 82 lbs/day. Furthermore, compliance with existing MBARD rules and regulations, such as Rule 402 (Nuisances), Rule 426 (Architectural Coatings), and Rule 425 (Use of Cutback Asphalt) would further minimize potential short-term

air quality impacts. Additionally, the implementation of standard construction Best Management Practices ("BMPs"), as well as standard dust suppression measures (e.g., watering) in compliance with Rule 402 would further reduce construction-generated PM_{10}. As shown in **Table 4.2-6**, construction-related impacts associated with the Proposed Project would be below the applicable MBARD threshold of significance for temporary construction-related effects. **As a result, short-term construction activities would have a less than significant air quality impact. No mitigation measures are necessary.**

Table 4.2-6
Construction Emissions of Criteria Air Pollutants

Construction Activity	ROG (lbs/day)	NO_X (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)	CO (lbs/day)
Demolition - On-Site:	2.4	22.2	1.1	0.9	19.9
Demolition - Off-Site:	0.1	0.4	9.8	1.0	0.8
Demolition - Total:	2.5	22.6	10.9	1.9	20.7
Site Preparation - On-Site:	3.3	31.6	1.4	1.3	30.2
Site Preparation - Off-Site:	0.1	0.1	7.4	0.8	<0.1
Site Preparation - Total:	3.4	31.7	8.8	2.1	30.2
Grading - On-Site:	3.2	29.7	10.5	4.8	28.3
Grading - Off-Site:	0.2	4.3	48.4	5.0	2.6
Grading - Total:	3.4	34.0	58.9	9.8	30.9
Building Construction - On-Site:	1.1	10.4	0.4	0.4	13.0
Building Construction - Off-Site:	0.1	0.6	7.6	0.8	0.5
Building Construction - Total:	1.2	11.0	8.0	1.2	13.5
Architectural Coating Application - On-Site:	45.6	0.9	<0.1	<0.1	1.1
Architectural Coating Application - Off-Site:	<0.1	<0.1	0.6	0.1	<0.1
Architectural Coating Application - Total:	45.6	0.9	0.6	0.1	1.1
Paving - On-Site:	0.8	7.1	0.3	0.3	9.9
Paving - Off-Site:	0.1	0.1	6.4	0.7	0.6
Paving - Total:	0.9	7.2	6.7	1.0	10.5
Maximum Daily Emissions: [1]	45.6	34.0	58.9	9.8	30.9
MBARD Significance Threshold[2]:	137	137	82	55	550
Exceeds Threshold/Significant Impact?	No	No	No	No	No

Source: 2024 CalEEMod Updated for Air Quality & Noise Consulting, Air Quality & Greenhouse Gas Impact Assessment for La Tourette Subdivision Project. June 2018.
See **Appendix A** for full CalEEMod Report.
NOTES:
1. Based on highest daily emissions during demolition, site preparation, grading, and building construction under summer or winter conditions; therefore, the phased approach is used to determine highest daily emissions during construction phase Assumes building construction, paving, and architectural coating application, could occur simultaneously.
The MBARD has not identified significance thresholds for ROG, NO_X, or $PM_{2.5}$. Emissions of ROG and NO_X are accommodated in the emission inventories of State- and federally required air plans and would not have a significant impact on the attainment and maintenance of ozone AAQS. Emissions of $PM_{2.5}$ are a component of PM_{10}.

Operational

The Proposed Project would not result in a cumulatively considerable net increase in any criteria pollutant during operation. For the purposes of this analysis, operational impacts would be potentially significant if direct and indirect emissions would exceed 137 lbs/day of either ROG or NO_X, 82 lbs/day of PM_{10}, or if the Project

would contribute to local PM_{10} concentrations that exceed applicable AAQS. Emissions of SO_X would be significant if the Project generates direct emissions of greater than 150 lbs/day.

Table 4.2-7 summarizes the daily operational emissions associated with the Proposed Project. The Proposed Project would generate maximum daily emissions of approximately 2.3 lbs/day of ROG, 1.6 lbs/day of NO_X, 9.4 lbs/day of CO, 0.02 lbs/day of SO_X, 18.5 lbs/day of PM_{10}, and 2.2 lbs/day of $PM_{2.5}$. Operational air quality effects would be below the applicable MBARD threshold of significance. Moreover, it is important to note that the updated CalEEMod analysis conservatively estimated operational emissions based on a buildout year of 2026. Operational emissions are projected to decline in future years due primarily to improvements in vehicle efficiency and reductions in energy use-related emissions. Daily operational emissions would not exceed applicable MBARD significance thresholds. **Long-term operation of the Proposed Project would be considered to have a less-than-significant air quality impact. No mitigation measures are necessary.**

Table 4.2-7
Operational Emissions of Criteria Air Pollutants

Operational Source	ROG (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	SO_2 (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Area Sources	1.5	0.3	1.8	<0.1	0.1	0.1
Energy Use	<0.1	0.2	0.1	<0.1	<0.1	<0.1
Mobile Sources	0.8	1.1	7.5	<0.1	18.4	2.1
Maximum Daily Emissions: [5]	2.3	1.6	9.4	0.02	18.5	2.2
MBARD Significance Threshold:	137	137	550	150	82	55
Exceeds Threshold/Significant Impact?	No	No	No	No	No	No

See **Appendix A** for full CalEEMod Report.
NOTES:
1. To be conservative, maximum daily emissions are based on the highest daily emissions for summer or winter conditions.

Significance: Less than Significant.

Mitigation: None.

Impact AQ-3: The Project would not expose sensitive receptors to substantial pollutant concentrations. This represents a less than significant impact. No mitigation measures are warranted. (Criterion c).

The construction and operation of the Proposed Project would not result in the exposure of sensitive receptors to substantial pollutant concentrations. The following evaluates the potential short-term and long-term air quality effects associated with the Proposed Project due to the exposure to specific types of pollutant concentrations, including naturally-occurring asbestos, DPM, and fugitive dust emissions.

Short-term Exposure

The Proposed Project would not result in a substantial short-term increase in pollutant concentrations, as outlined below.

Naturally-Occurring Asbestos. Naturally-occurring asbestos, which CARB identified as a TAC in 1986, is located in many parts of California and is commonly associated with ultramafic rock. The Project site is not located near any areas that are likely to contain ultramafic rock (DOC, 2000). **As a result, risk of exposure to asbestos during the construction process would be considered less than significant. No mitigation measures are necessary.**

DPM Emissions. The Proposed Project would generate DPM emissions during construction. This would occur in connection with the use of off-road diesel equipment for site grading and excavation, paving, and other construction activities. Health-related risks associated with diesel-exhaust emissions are primarily associated with long-term exposure and associated risk of contracting cancer. For residential land uses, the cancer risk calculation associated with exposure to TACs is typically calculated based on a 25 to 30-year period of exposure. While the Proposed Project would entail the use of diesel-powered equipment during construction, this use would be temporary in duration and would occur over a relatively large area. Ambient assumed that construction activities involving the use of diesel-fueled equipment would occur over a 12-month period. This exposure would constitute less than four (4) percent of the typical exposure period. As a result, Ambient concluded that exposure to construction-generated DPM would not exceed applicable thresholds (i.e., incremental increase in cancer risk of 10 in one million). **This impact represents a less than significant impact. No mitigation measures are necessary.**

Fugitive Dust Emissions. The Proposed Project would result in short-term emissions of fugitive PM associated with ground disturbance and demolition of existing onsite structures. In addition, the demolition of onsite structures could result in the disturbance of asbestos-containing materials. Potential temporary construction-related effects would, however, be less-than-significant through the compliance with applicable MBARD rules and regulations, including but not limited to, Rule 402 for the control of nuisance–related emissions and Rule 424 for the handling of asbestos-containing building materials. Compliance with existing MBARD rules and regulations would ensure that potential temporary construction-related effects would not expose nearby land uses to a substantial pollutant hazard. Moreover, as discussed above (see Impact AQ-3), construction-generated PM_{10} would not exceed MBARD's daily significance threshold of 82 lbs/day. **For these reasons, the Project would have a less than significant short-term impact to nearby sensitive receptors. No mitigation measures are necessary.**

Long-term Exposure

The Proposed Project would not result in a substantial long-term increase in pollutant concentrations. The Proposed Project would not result in the installation of any major stationary sources of emissions. As a result, CO generated by mobile sources would be considered the primary pollutant of local concern. Mobile-source emissions of CO are a direct function of traffic volume, speed, and delay. Transport of CO is extremely limited because it disperses rapidly with distance from the source under normal meteorological conditions. However, under specific meteorological and operational conditions, such as near heavily congested vehicle traffic areas, CO concentrations may reach unhealthy levels. If inhaled, CO can be adsorbed easily by the bloodstream and can inhibit oxygen delivery to the body, which can cause significant health effects ranging from slight headaches to death. The most serious effects are felt by individuals susceptible to oxygen deficiencies, including people with anemia and those suffering from chronic lung or heart disease. For this reason, localized mobile-source CO concentrations are of potential concern near signalized intersections that experience high traffic volumes/vehicle congestion and are projected to operate at unacceptable levels of service (i.e., LOS E, or worse) (Caltrans, 1996).

The primarily affected signalized intersection in the Project area would include the Prunedale South Road/Blackie Road intersection. The Prunedale South Road/Blackie Road intersection is projected to operate at LOS B, or better, during the peak commute hours (Keith Higgins, 2017). In comparison to the CO screening criteria, the Proposed Project's would not result in or contribute to unacceptable levels of service (i.e., LOS E, or worse) at primarily affected signalized intersections. For this reason, and given the regions' low background CO concentrations, Ambient concluded that the Proposed Project would not result in or contribute to localized mobile-source CO concentrations that would exceed applicable ambient air quality standards. **This impact would be considered less than significant. No mitigation measures are necessary.**

Significance: Less than Significant.

Mitigation: None.

Impact AQ-4: The Project would not create objectionable odors affecting a substantial number of people. This represents a less than significant impact. No mitigation measures are warranted. (Criterion d).

The Proposed Project would not create an objectionable odor that would affect a substantial number of people. The Project consists of a residential subdivision; no odor generating facilities are proposed as part of the Project. The Proposed Project would not result in the installation of any major sources of odors. In addition, no major sources of odors have been identified in the vicinity of the Project site. As a result, the Proposed Project would not result in the long-term exposure of individuals to increased concentrations of odors. While the Proposed Project would not result in the long-term exposure of individuals to increased concentration of odors, construction of the Proposed Project would involve the use of a variety of gasoline or diesel-powered equipment that would emit exhaust fumes. Exhaust fumes, particularly diesel-exhaust, may be considered objectionable. In addition, pavement coatings and architectural coatings used during construction would also emit temporary odors. However, construction-generated emissions would occur intermittently and would dissipate rapidly with increasing distance from the source. As a result, short-term construction activities would not expose a substantial number of people to frequent odorous emissions. **This represents a less than significant impact. No mitigation measures are necessary.**

Significance: Less than Significant.

Mitigation: None.

4.2.5 REFERENCES

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4.3 BIOLOGICAL RESOURCES

4.3.1 INTRODUCTION

This section evaluates the potential impacts to biological resources associated with the development of the Proposed Project. The following section: 1) describes the environmental setting, 2) identifies the regulatory requirements applicable to the Proposed Project, and 3) evaluates the potential environmental effects associated with the Proposed Project and identifies applicable mitigation measures to reduce the extent of impacts to a less than significant level, where feasible. This section reflects DD&A's independent analysis of the Proposed Project based on information prepared by the Project Applicant, DD&A's review of available background literature, and biological surveys of the project site. In addition, this section is based on information contained in the Project's Forest Management Plan ("FMP"), prepared by Staub in 2006 (**Appendix D**) and updated by DD&A in 2021(**Appendix E**). **Table 4.3-1** summarizes the anticipated environmental effects of the Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.3.4, Impacts and Mitigation Measures**.

Table 4.3-1
Summary of Biological Resources Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measure	Residual Impact
BIO-1	The Proposed Project may result in direct and indirect impacts to special-status plants and wildlife, sensitive habitats, and protected trees. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation.	Potentially Significant	BIO-1a - BIO-1e and resource-specific measures below	Less than Significant
BIO-2	The Proposed Project may result in direct impacts to Hickman's onion, Anderson's manzanita, Hooker's manzanita, Pajaro manzanita, sandmat manzanita, Monterey spineflower, Eastwood's goldenbush, Kellogg's horkelia, marsh microseris, northern curly-leaved monardella, Dudley's lousewort, Yadon's rein orchid, saline clover, and Choris's popcornflower, if present within or directly adjacent to the construction footprint.	Potentially Significant	BIO-1a - BIO-1e BIO-2a - BIO-2c	Less than Significant
BIO-3	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of pallid bat, Townsend's big-eared bat, Monterey dusky-footed woodrat, and mountain lion, if present within the Project site, and in disturbance and loss of habitat.	Potentially Significant	BIO-1a - BIO-1e BIO-3a - BIO-3b	Less than Significant
BIO-4	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of California tiger salamander, California red-legged frog, Coast Range newt, California legless lizard, and coast horned lizard, if present within the Project site, and in disturbance and loss of habitat.	Potentially Significant	BIO-1a - BIO-1e BIO-4a - BIO-4c	Less than Significant

Impact	Summary	Significance	Mitigation Measure	Residual Impact
BIO-5	The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of raptors and other nesting birds, including, but not limited to, the special-status white-tailed kite and loggerhead shrike.	Potentially Significant	BIO-1a - BIO-1e BIO-5a	Less than Significant
BIO-6	The Proposed Project would require grading, excavation, and other activities that may result in: 1) mortality or disturbance of Crotch's Bumble Bee and Western Bumble Bee, if present within the Project site; and, 2) disturbance and loss of Crotch's Bumble Bee and Western Bumble Bee habitat.	Potentially Significant	BIO-1a - BIO-1e BIO-6a	Less than Significant
BIO-7	The Proposed Project would require grading, excavation, and other activities that may result in a permanent loss or disturbance of sensitive maritime chaparral habitat.	Potentially Significant	BIO-1a - BIO-1e BIO-2b- BIO-2c BIO-7a	Less than Significant
BIO-8	Development of the Proposed Project is not expected to significantly interfere with the movement or migration patterns of fish or other wildlife.	Less than Significant	None	Less than Significant
BIO-9	The Proposed Project would require the removal of native trees (coast live oaks) and non-native trees (Monterey pine) within the development areas. Construction activities may result in impacts to trees not planned for removal.	Potentially Significant	BIO-1d BIO-1e BIO-9a - BIO-9c	Less than Significant

4.3.2 METHODS

4.3.2.1 Personnel and Survey Methods

DD&A biologists conducted various biological surveys at the Project site between 2004 and 2019. **Table 4.3-2** identifies the dates and types of surveys conducted. Botanical surveys consisted of identifying all plant species found on the site to the intraspecific taxon necessary to exclude it as being a special-status species. Habitats within the Project site were characterized in the field to assess for potential project-related impacts to wildlife and wildlife habitats, and for potential occurrences of special-status wildlife species. During 2019 surveys, DD&A also evaluated existing conditions, including forest health, native oak populations, potential for tree retention, and ecological impacts to update the Staub FMP. Data collected during these surveys were used to assess the environmental conditions of the Project site and its surroundings, evaluate environmental constraints at the site and within the local vicinity, and provide a basis for recommendations to minimize and avoid impacts.

Table 4.3-2
Biological Surveys Conducted within the Project Site

Survey Date	Survey Type	Surveyor
May 19, 2004	Focused botanical survey for spring- and early-summer blooming plants and reconnaissance-level wildlife survey	DD&A
October 25, 2004	General biological assessment and reconnaissance-level wildlife survey	DD&A
September 7, 2006	General biological assessment and reconnaissance-level wildlife survey	DD&A
April 16, 2007	Focused botanical survey for spring-blooming plants and reconnaissance-level wildlife survey	DD&A

Survey Date	Survey Type	Surveyor
May 16 and 17, 2016	Focused botanical survey for spring- and early-summer blooming plants and reconnaissance-level wildlife survey	DD&A
January 9 and 10, 2019	Habitat verification and reconnaissance-level wildlife survey	DD&A
January 18, 2019	Tree survey	DD&A

The U.S. Fish and Wildlife Service's ("Service") protocol for special-status plant surveys requires that surveys are conducted approximately every three (3) years (Service, 2000), while the California Department of Fish and Wildlife's ("CDFW's") protocol requires that surveys are conducted every one to five(5) years depending on the vegetation types present (CDFW, 2021). Botanical surveys between 2004 and 2016 were conducted in accordance with Service, CDFW, and California Native Plant Society ("CNPS") protocols. Surveys in 2019 were conducted to verify vegetation associations and did not include protocol botanical surveys. Therefore, this analysis assumes that special-status plants that were identified within the Project site during previous surveys are likely still present within the site, but does not exclude the potential for other special-status plants to occur within the site if suitable habitat is present and there are known occurrences in the vicinity.

4.3.2.2 Data Sources

The primary literature and data sources reviewed to determine the presence or potential presence of special-status species and biological resources within the Project site include:

- Current agency status information from the Service and CDFW for species listed, proposed for listing, or candidates for listing as threatened or endangered under the federal Endangered Species Act ("ESA") or the California Endangered Species Act ("CESA"), and those considered CDFW "species of special concern" ("SSC"), including:
    - California Natural Diversity Database ("CNDDB") occurrence reports from the U.S. Geological Survey ("USGS") Chittenden, Marina, Moss Landing, Natividad, Prunedale, Salinas, San Juan Bautista, Watsonville East, and Watsonville West quadrangles (**Appendix F**; CDFW, 2024a), and
    - The Service's Information for Planning and Consultation ("IPaC") Resource List for the project site (**Appendix G**; Service, 2024a);
- The CNPS Inventory of Rare and Endangered Vascular Plants of California ("CNPS", 2024); and
- eBird occurrences[1] (Cornell Lab of Ornithology, 2024).

From these resources, a list of special-status plant and wildlife species known or with the potential to occur in the vicinity of the Project site was created (**Appendix H**). This list presents these species along with their legal status, habitat requirements, and a brief statement of the likelihood to occur within the Project site.

In addition, the following literature and data sources were reviewed to determine the occurrence or potential for occurrence of other sensitive natural resources within the Project site:

[1] eBird is a citizen science platform for documenting avian observations. eBird data is reviewed by volunteer birding experts; however, most reviews are of rare or unusual observations only. Because the data is not verifiable, eBird occurrences are used in this document to supplement verifiable data provided in the CNDDB and other resources.

- Forest Management Plan for Monterey County APN 125-101-016 (Staub, 2006; **Appendix D**);
- Updates to the Existing Forest Management Plan for the La Tourette Subdivision Project (DD&A, 2021; **Appendix E**).
- *California Natural Communities List* (CDFW, 2023);
- The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA-NRCS, 2024);
- The National Wetlands Inventory Wetlands Mapper (USFWS, 2024b); and
- The National Hydrography Dataset (U.S. Geologic Survey [USGS], 2023).

4.3.2.3 Definitions

Special-Status Species

Special-status species are those plants and animals that have been formally listed or proposed for listing as endangered or threatened or are candidates for such listing under ESA or CESA. Listed species are afforded legal protection under the ESA and CESA. Species that meet the definition of rare or endangered under the CEQA Guidelines Sec. 15380 are also considered special-status species. Animals on the CDFW's list of "species of special concern" (most of which are species whose breeding populations in California may face extirpation if current population trends continue) meet this definition and are typically provided management consideration through the CEQA process, although they are not legally protected under the ESA or CESA. Additionally, CDFW also includes some animal species that are not assigned any of the other status designations on their "Special Animals" list (CDFW, 2024b); however, these species have no legal or protection status and are not evaluated in this analysis.

Plants listed as rare under the California Native Plant Protection Act ("CNPPA") or included in CNPS California Rare Plant Ranks ("CRPR") 1A, 1B, 2A, and 2B are also treated as special-status species as they meet the definitions of Sec. 2062 and Sec. 2067 of the CESA and CEQA Guidelines Sec. 15380. In general, the CDFW requires that plant species on CRPR 1A (plants presumed extirpated in California and either rare or extinct elsewhere), CRPR 1B (plants rare, threatened, or endangered in California and elsewhere), CRPR 2A (plants presumed extirpated in California, but more common elsewhere), and CRPR 2B (plants rare, threatened, or endangered in California, but more common elsewhere) of the CNPS *Inventory of Rare and Endangered Vascular Plants of California* (CNPS, 2024) be fully considered during the preparation of environmental documents relating to CEQA. CRPR 3 (plants about which more information is needed) and CRPR 4 species (plants of limited distribution) may, but generally do not, meet the definitions of Sec. 2062 and Sec. 2067 of CESA, and are not typically considered in environmental documents relating to CEQA. While other species (i.e., CRPR 3 or 4 species) are sometimes found in database searches or within the literature, these do not meet the definitions of Sec. 2062 and Sec. 2067 of CESA and are not analyzed in this EIR.

Raptors (e.g., eagles, hawks, and owls) and their nests are protected under the federal Migratory Bird Treaty Act ("MBTA") California Fish and Game Code Sec. 3503.5. Section 3503.5 states that it is "unlawful to take, possess, or destroy the nest or eggs of any such bird except otherwise provided by this code or any regulation adopted pursuant thereto." In addition, protected species under Fish and Game Code Sec. 3511 (birds), Sec. 4700 (mammals), Sec. 5515 (fish), and Sec. 5050 (reptiles and amphibians) are also considered special-status animal species. Species with no formal special-status designation but thought by experts to be rare or in serious

decline may also be considered special-status animal species in some cases, depending on project-specific analysis and relevant, localized conservation needs or precedence.

Sensitive Habitats

Sensitive habitats include riparian corridors, wetlands, habitats for legally protected species, areas of high biological diversity, areas supporting rare or special-status wildlife habitat, and unusual or regionally restricted habitat types. Vegetation communities considered sensitive include those listed on CDFW's *California Natural Communities List* (i.e., those habitats that are rare or endangered within the borders of California) (CDFW, 2023), those that are occupied by species listed under the ESA or are critical habitat in accordance with ESA, and those that are defined as Environmentally Sensitive Habitat Areas ("ESHA") under the California Coastal Act ("Coastal Act"). Specific habitats may also be identified as sensitive in city or county general plans or ordinances. Sensitive habitats are regulated under federal regulations (such as the Clean Water Act ["CWA"] and Executive Order ["EO"] 11990 – Protection of Wetlands), state regulations (such as CEQA and the CDFW Streambed Alteration Program), or local ordinances or policies (such as city or county tree ordinances and general plan policies).

4.3.3 ENVIRONMENTAL SETTING

The Project is located within north Monterey County and vegetation is influenced by the mild coastal climate of the region. There are nine (9) vegetation associations within the North County Planning Area, which include coastal strand, coastal salt marsh, freshwater marsh, riparian woodland, non-native grassland, coastal sage scrub, maritime chaparral, and foothill woodland (County, 2010). Several of these vegetation associations are unique to the area due to local topography, soil types, and microclimate, and support rare plants and wildlife.

The Project site is in a wooded, rural area of the County near Prunedale. The Project area is composed mainly of rolling hills supporting some grazing and rural residential development. The property is generally surrounded by rural residential uses to the west, north, and east (these areas are designated for 5-acre minimum parcel size), and a developed 19-lot residential subdivision (Woodland Heights) to the south, which was approved in 1996 and contains lots averaging 2.5 acres in size. The Project site contains both gentle to moderate swale/valley bottoms and ridgetops and moderate to somewhat steeper hillsides. Existing development includes three (3) single-family residences (mobile homes), dirt roads, water tanks, and supporting structures and infrastructure. The northwest portion of the Project area is disturbed due to a historical regime of clearing and grubbing of the natural vegetation for agricultural purposes.

4.3.3.1 Habitat Types

The vegetative habitats on the Project site are typical of the lower slopes of the northern terminus of the South Coast Range foothills. The vegetation consists of a matrix of maritime chaparral, disturbed annual grassland, disturbed maritime chaparral, mixed oak woodland, mixed evergreen forest, and ruderal (drainage basin). The Project site also contains a few occupied residences and scattered remnant unoccupied structures, including abandoned cars and storage sheds. The locations of habitat types within the Project site are illustrated on **Figure 4.3-1** and their acreages are shown in **Table 4.3-3**, including acreage within the proposed conservation easements and areas of impact.[2] The habitat types within the Project site are described below. A generalized nomenclature for habitat types is used within this document for ease of reference; however, each description also lists the *Manual of California Vegetation* (Sawyer et.al., 2009) vegetation type(s) in order to provide a crosswalk to the *Natural Communities List* (CDFW, 2023).

Table 4.3-3
Site Habitat Acreages

Habitat Type	Total Acres	Subdivision Improvements Impact Area (Acres)*	Building/Sceptic Envelope Impact Area (Acres)*	Total Impact Area (Acres)*	Conservation Easement Area (Acres)*
Disturbed Annual Grassland	15.6	1.1	6.6	7.7	7.8
Mixed Oak Woodland	13.5	1.3	3.0	4.3	9.1
Maritime Chaparral	8.6	0.5	3.1	3.6	5.0
Mixed Evergreen	6.9	1.7	2.4	4.2	2.8
Disturbed Maritime Chaparral/ Annual Grassland Mix	3.9	0.3	1.6	1.9	2.1
Ruderal (Drainage Basin)	0.2	0.1	0	0.1	0.1
Total	**48.7***	**5.1**	**16.8**	**21.8**	**26.9**

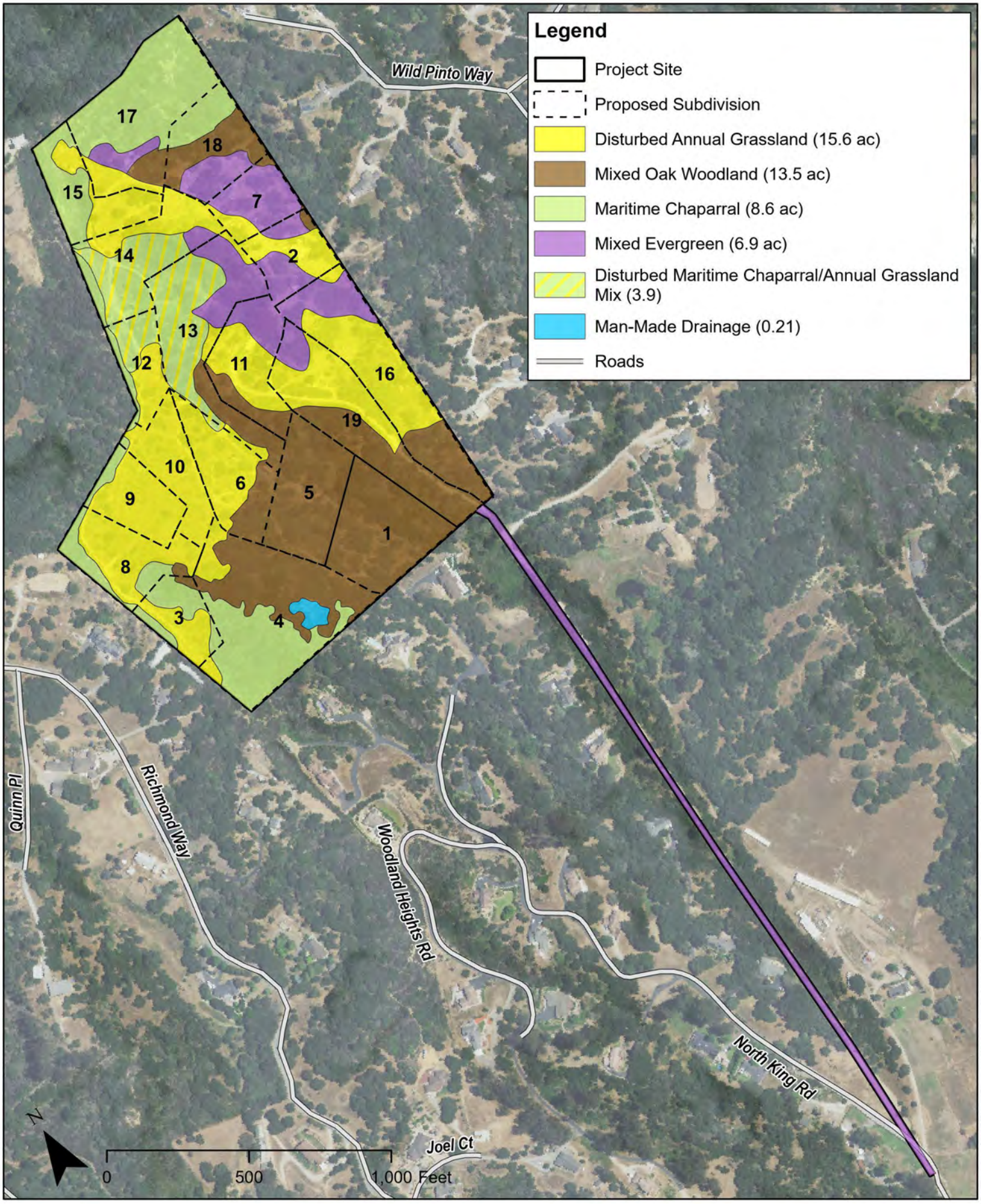
*Note: The acreages provided include the area within the parcel (47.57 ac.) and the North King Road improvements area (1.5 ac.).

Disturbed Annual Grassland

- *A Manual of California Vegetation* classification(s): Wild Oats and Annual Brome Grasslands (*Avena* spp. – *Bromus* ssp. Semi-natural Alliance)
- *California Natural Communities List*: Not sensitive

Disturbed annual grassland habitat is the most prevalent habitat type within the Project site, comprising approximately 15.6 acres. This habitat type is dominated by annual, non-native species, including slender wild oat (*Avena barbata*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), English plantain (*Plantago lanceolata*), jubata (pampas) grass (*Cortaderia jubata*), iceplant (*Carpobrotus chilense* and *C. edulis*), and fescue grass (*Festuca sp.*).

[2] The conservation easements include the areas that have been identified as scenic easements as identified in Chapter 3, and discussed in further detail in Section 4.1 Aesthetics.



Habitat Types

Date: 6/29/2022

Scale: 1:5,200

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Planning and Environmental Consulting

Figure 4.3-1

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Common wildlife species which do well in urbanized and disturbed areas can utilize this habitat, such as the American crow (*Corvus brachyrhynchos*), raccoon (*Procyon lotor*), skunk (*Mephitis mephitis*), scrub jay (*Aphelocoma californica*), European starling (*Sturnus vulgaris*), western fence lizard (*Sceloporus occidentalis*), California ground squirrel (*Spermophilus beecheyi*), and rock dove (*Columba livia*).

Mixed Oak Woodland

- A Manual of California Vegetation classification(s): Coast live oak woodland (*Quercus agrifolia/ Toxicodendron diversilobum* Association)
- California Natural Communities List: Not Sensitive

The mixed oak woodland is primarily located in lower areas on east-facing slopes but integrates with the maritime chaparral and the planted trees associated with the residential areas. Dominant species within this habitat type include coast live oak (*Quercus agrifolia*), poison oak, ripgut grass, fescue grass, smooth cat's ear (*Hypochaeris glabra*), soft chess, iceplant, slender wild oat, and jubata grass. There is a history of introduction of numerous exotic tree species (e.g., Eucalyptus [*Eucalyptus* sp.]and fruit trees) as well as regionally common trees which are not native to this site (e.g., Monterey pine [*Pinus radiata*] and coast redwoods [*Sequioa sempervirens*]). There are numerous fruit trees and landscape trees surrounding the residences. There are approximately 13.5 acres of mixed oak woodland within the Project site.

Oaks provide nesting sites for many species of birds and cover for a variety of mammals, including mourning dove (*Zenaida macroura*), American kestrel (*Falco sparverius*), California ground squirrel, and California pocket mouse (*Chaetodipus californicus*). Acorns provide an important food source for acorn woodpecker (*Melanerpes formicivorus*), scrub jay, and black-tailed deer (*Odocoileus hemionus columbianus*). Other common wildlife species found in the oak woodland are California mouse (*Peromyscus californicus*), raccoon, Nuttall's woodpecker (*Picoides nuttallii*), bobcat (*Lynx rufus*), and coyote (*Canis latrans*). Generally, red-tailed hawks (*Buteo jamaicensis*) nest and roost in the taller coast live oaks.

Maritime Chaparral

- A Manual of California Vegetation classification(s): Pajaro Manzanita Chaparral (*Arctostaphylos pajaroensis* Shrubland Alliance)
- California Natural Communities List: Sensitive

Maritime chaparral is identified in the Monterey County General Plan as one of the County's *threatened or limited plant communities* and by the CDFW as a *sensitive natural community* (CDFW 2023). It occurs on the exposed, rocky upper slopes on approximately 8.6 acres of the Project site. This habitat's distribution is extremely limited as it is found only in a few isolated locations along the coast that contain specific micro-climactic conditions, including summer fog and loose sandy soils. The maritime chaparral within the Project site is dominated by Pajaro manzanita (*Arctostaphylos pajaroensis*), Hooker's manzanita (*A. hookeri ssp. hookeri*), sandmat manzanita (*A. pumila*), dwarf ceanothus (*Ceanothus dentatus*), rush rose (*Helianthemum scoparius*), poison oak, sticky monkeyflower (*Diplacus aurantiacus*), chamise (*Adenostoma fasciculatum*), coyote brush (*Baccharis pilularis*), golden yarrow (*Eriophyllum confertiflorum*), Fremont's star lily (*Zigadenus fremontii* var. *fremontii*), California sagebrush (*Artemisia californica*), deerweed (*Acmispon glaber*), small-leaved lomatium (*Lomatium parvifolium*), and common yarrow (*Achillea millefolium*).

Common wildlife species that are known to utilize this habitat include orange-crowned warbler (*Vermivora celata*), wren-tit (*Chamaea fasciata*), rufous-sided towhee (*Pipilo erythrophthalmus*), California quail (*Callipepla californica*), California pocket mouse, California mouse (*Peromyscus californicus*), brush rabbit (*Sylvilagus bachmani*), bobcat, northern pacific rattlesnake (*Crotalus oreganus oreganus*), and gray fox (*Urocyon cinereoargenteus*).

Mixed Evergreen Forest

- A Manual of California Vegetation classification(s): None
- California Natural Communities List: Not Sensitive

Mixed evergreen forest habitat consists of areas that are dominated by non-native trees, including blue gum eucalyptus (*Eucalyptus globulus*), coast redwood, and Monterey pine[3]. While a large number of oak trees occur within mixed evergreen forest areas, typical species that are attributed to oak woodland understory are mostly absent from this habitat and the understory is covered mostly by leaf litter consisting predominately of pine needles and eucalyptus leaves. Approximately 6.9 acres of mixed evergreen habitat occurs within the Project site.

Common wildlife species that would utilize oak woodland habitat may also occur within mixed evergreen forest habitat.

Disturbed Maritime Chaparral/Annual Grassland Mix.

- A Manual of California Vegetation classification(s): Pajaro Manzanita Chaparral (*Arctostaphylos pajaroensis* Shrubland Alliance) and Wild Oats and Annual Brome Grasslands (*Avena* spp. – *Bromus* ssp. Semi-natural Alliance)
- California Natural Communities List: Sensitive

Based on the site visits, aerial photographs, and discussions with the property owner, the disturbance to the vegetation located on the northwestern portion of the site is a result of the historic clearing and grubbing of the native vegetation. There are several piles of debris consisting of wood and dead vegetation throughout these areas, and it appears that these areas continue to be maintained by mowing and grubbing. Vegetation prior to the disturbance was maritime chaparral, as evidenced by reviewing historic aerial photographs and observations during the site investigations of species that are typically associated with maritime chaparral habitat (e.g., Pajaro manzanita, chamise, rush rose, star lily, sticky monkeyflower, dwarf ceanothus, and deerweed) sprouting within these areas. These areas are now heavily disturbed and dominated by non-native, invasive species, including annual grasses, jubata grass, and iceplant. Due to dominance of annual grasses within these areas, the disturbed maritime chaparral habitat within the project site closely resembles disturbed annual grassland habitat and is therefore not considered a sensitive habitat. There are approximately 3.9 acres of disturbed maritime chaparral within the Project site.

The same wildlife species that utilize the maritime chaparral and disturbed annual grassland habitats would be expected to utilize the disturbed maritime chaparral/annual grassland mix habitat.

[3] While Monterey pine is a native, sensitive species within the County, the specimens within the project are of horticultural heritage and are not considered native or special-status; while they are not considered invasive, they are not given the same level of management consideration as those that exist within the known historical range for the species.

Ruderal (Drainage Basin)

- A Manual of California Vegetation classification(s): None
- California Natural Communities List: Not Sensitive

A man-made drainage basin currently exists within in the southwestern portion of the Project site, near the proposed boundaries of Lot 4. The drainage basin was created to catch runoff from the historic farming activities and currently functions as a sedimentation pond. According to the Applicant, the basin is cleared annually of vegetation and does not retain water for any significant period. There was no standing water present at any of the field visits conducted by DD&A. Due to the regular maintenance, the vegetation is very disturbed and dominated by ruderal (weedy) species, such as Italian ryegrass (*Festuca perennis*), bristly ox-tongue (*Helminthotheca echoides*), scarlet pimpernel (*Lysimachia arvensis*), soft chess, and smooth cat's ear; however, some native species are also present, including western rush (*Juncus occidentalis*), blue-eyed grass (*Sisyrinchium bellum*), dwarf brodiaea (*Brodiaea terrestris*), and lotus (*Lotus* sp.). The ruderal drainage basin comprises approximately 0.2 acre of the Project site.

It is anticipated that the same wildlife species that utilize the surrounding habitats would utilize the basin as well.

4.3.3.2 Special-Status Species

Special-Status Plants

The Project site was evaluated for the presence or potential presence of a variety of special-status plant species known to occur in Monterey County (**Appendix H**). As described above, the results of previous botanical surveys may not reflect current conditions. Therefore, this analysis assumes that special-status plants that were identified within the project site during previous surveys are likely still present within the site, but does not exclude the potential for other special-status plants to occur within the site if suitable habitat is present and there are known occurrences in the vicinity. As a result, several special-status plant species were determined to be present or to have a moderate or high potential to occur within the Project site (**Appendix H**). These species are discussed below. All other species presented in **Appendix H** are assumed "unlikely to occur" or have a low potential to occur and are unlikely to be impacted for the species-specific reasons presented in **Appendix H** and are not discussed further.

Hickman's Onion. Hickman's onion (*Allium hickmanii*) is a CNPS CRPR 1B species typically associated with closed-cone coniferous forest, maritime chaparral, coastal prairie, coastal scrub, and valley and foothill grasslands. Suitable habitat for this species is present within maritime chaparral and mixed evergreen forest areas of the Project site. The nearest CNDDB occurrence is located approximately 10.5 mi from the Project site. Therefore, this species has a moderate potential to occur within the project site where suitable habitat is present.

Anderson's Manzanita. Anderson's manzanita (*A. andersonii*) is a CNPS CRPR 1B species typically associated with openings and edges of broadleaved upland forest, chaparral, and north coast coniferous forest. This species was identified within the Project site during botanical surveys conducted between 2004 and 2016 and is assumed to still be present within the Project site where suitable habitat is present.

Hooker's Manzanita. Hooker's manzanita is a CNPS CRPR 1B species typically associated with closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub on sandy substrates. This species was identified within the Project site during botanical surveys conducted between 2004 and 2016 and is assumed to still be present within the Project site where suitable habitat is present.

Pajaro Manzanita. Pajaro manzanita is a CNPS CRPR 1B species typically associated with chaparral habitat in sandy areas. This species was identified within the Project site during botanical surveys conducted between 2004 and 2016 and is assumed to still be present within the Project site where suitable habitat is present.

Sandmat Manzanita. Sandmat manzanita is a CNPS CRPR 1B species typically associated with openings in closed-cone coniferous forest, maritime chaparral, cismontane woodland, coastal dunes, and coastal scrub in sandy areas. This species was identified within the Project site during botanical surveys conducted between 2004 and 2016 and is assumed to still be present within the Project site where suitable habitat is present.

Monterey Spineflower. Monterey spineflower (*Chorizanthe pungens* var. *pungens*) is a federally threatened and CNPS CRPR 1B species which typically occurs on open sandy or gravelly soils on relic dunes in coastal dune, coastal scrub, and maritime chaparral habitats, though it can also be associated with cismontane woodlands and valley and foothill grasslands. Suitable habitat for this species is present within maritime chaparral and annual grassland areas on the Project site. The nearest CNDDB occurrence is located approximately 1,640 feet from the Project site. Therefore, this species has a high potential to occur within the Project site where suitable habitat is present.

Seaside Bird's-Beak. Seaside bird's-beak (*Cordylanthus rigidus* ssp. *littoralis*) is a state endangered and CNPS CRPR 1B species typically associated with closed-cone coniferous forests, maritime chaparral, cismontane woodlands, coastal dunes, and coastal scrub on sandy soils, often on disturbed sites. Suitable habitat for this species is present within maritime chaparral, oak woodland, and mixed evergreen forest areas of the Project site. The nearest CNDDB occurrence is located approximately 5.6 miles from the Project site. Therefore, this species has a moderate potential to occur within the Project site where suitable habitat is present.

Eastwood's Goldenbush. Eastwood's goldenbush (*Ericameria fasciculata*) is a CNPS CRPR 1B species typically associated with openings in closed-cone coniferous forest, maritime chaparral, coastal dunes, and coastal scrub on sandy soils. Suitable habitat for this species is present within maritime chaparral areas of the Project site. Several CNDDB occurrences of this species are reported within 1,000 feet the Project site. Therefore, this species has a high potential to occur within the Project site where suitable habitat is present.

Kellogg's Horkelia. Kellogg's horkelia (*Horkelia cuneata* var. *sericea*) is a CNPS CRPR 1B species typically associated with openings of closed-cone coniferous forests, maritime chaparral, coastal dunes, and coastal scrub on sandy or gravelly soils. Suitable habitat for this species is present within maritime chaparral areas of the Project site. The nearest CNDDB occurrence is located approximately 10 miles from the project site. Therefore, this species has a moderate potential to occur within the Project site where suitable habitat is present.

Marsh Microseris. Marsh microseris (*Microseris paludosa*) is a CNPS CRPR 1B species typically associated with closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. Suitable habitat for this species is present within mixed evergreen forest, oak woodland, and annual grassland areas of the Project site. Marginal habitat may also be present within the ruderal drainage basin. The nearest CNDDB

occurrence is located approximately 12 miles from the Project site. Therefore, this species has a moderate potential to occur within the Project site where suitable habitat is present.

Northern Curly-Leaved Monardella. Northern curly-leaved monardella (*Monardella sinuata* ssp. *nigrescens*) is a CNPS CRPR 1B species typically associated with chaparral, coastal dunes, coastal scrub, and lower montane coniferous forest (ponderosa pine sandhills) on sandy soils. Suitable habitat for this species is present within maritime chaparral areas of the Project site. The nearest CNDDB occurrence is reported approximately 10.5 miles from the Project site. Therefore, this species has a moderate potential to occur within the Project site where suitable habitat is present.

Dudley's Lousewort. Dudley's lousewort (*Pedicularis dudleyi*) is a CNPS CRPR 1B species typically associated with maritime chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland. Suitable habitat for this species is present within maritime chaparral, oak woodland, mixed evergreen forest, and annual grassland areas of the project site. The nearest CNDDB occurrence is reported approximately 18 miles from the Project site. Therefore, this species has a moderate potential to occur within the Project site where suitable habitat is present.

Yadon's Rein Orchid. Yadon's rein orchid (*Piperia yadonii*) is a federally endangered and CNPS CRPR 1B species typically associated with sandy soils in coastal bluff scrub, closed-cone coniferous forest, and maritime chaparral. This species was identified within the Project site during botanical surveys conducted between 2004 and 2016 and is assumed to still be present within the Project site where suitable habitat is present.

Choris's Popcornflower. Choris's popcornflower (*Plagiobothrys chorisianus* var. *chorisianus*) is a CNPS CRPR 1B species typically associated with mesic areas of chaparral, coastal prairie, and coastal scrub. Suitable habitat for this species is present within maritime chaparral areas of the project site. Marginal habitat may also be present in the ruderal drainage basin. The nearest CNDDB occurrence is reported approximately 7.5 miles from the Project site. Therefore, this species has a moderate potential to occur within the Project site where suitable habitat is present.

Saline Clover. Saline clover (*Trifolium hydrophilum*) is a CNPS CRPR 1B species typically found in marshes, swamps, vernal pools, and mesic areas of valley and foothill grassland on alkaline soils. Suitable habitat for this species is present within the ruderal drainage basin within the project site. The nearest CNDDB occurrences re reported approximately 7.5 miles from the Project site. Therefore, this species has a moderate potential to occur within the Project site where suitable habitat is present.

Special-Status Wildlife

The Project site was evaluated for the presence or potential presence of a variety of special-status wildlife species known to occur in Monterey County (**Appendix H**). Based on field observations, presence of suitable habitat, and known occurrences of these species in the vicinity, several special-status wildlife species were determined to be present or to have a moderate or high potential to occur within or directly adjacent to the Project site (**Appendix H**). These species are discussed below. All other species presented in **Appendix H** are assumed "unlikely to occur" or have a low potential to occur and are unlikely to be impacted for the species-specific reasons presented in **Appendix H** and are not discussed further.

Pallid Bat and Townsend's Big-Eared Bat. The pallid bat *(Antrozous pallidus)* is a CDFW species of special concern. It is a year-round resident in California. This species of bat occurs in a wide variety of habitats, including grasslands, shrublands, arid desert areas, oak savanna, coastal forested areas, and coniferous forests of the mountain regions of California. Pallid bats are most common in open, dry habitats with rocky areas for roosting. Day roosts of this species include caves, crevices, mines, and occasionally in hollow trees and buildings. This species seems to prefer rocky outcrops, cliffs, and crevices with access to open habitats for foraging. Pallid bats make use of similar structures for night roosting and will use more open sites such as eaves, awnings, and open areas under bridges for feeding roosts. Pallid bats feed on large insects, one to three inches in length. Foraging takes place over open ground, at heights generally not greater than 7.5 feet, although prey is most often caught on the ground. Jerusalem crickets, scorpions, and beetles make up most of the diet of pallid bats in central California. Copulation occurs in the fall, usually October through December. Females store the sperm and ovulation occurs in the following spring. The timing of birth is determined by local climate and embryonic development usually takes about nine weeks with birth occurring in May or June. Twins are common in northern California, but in other areas they are known to have triplets. Maternity colonies range from 20 to 200 individual adult bats. Males roost in much smaller groupings.

The Townsend's big-eared bat (*Corynorhinus townsendii*) is found primarily in rural settings from inland deserts to coastal redwoods, oak woodland of the inner Coast Ranges and Sierra foothills, and low to mid-elevation mixed coniferous-deciduous forests. Townsend's big-eared bats typically roost during the day in caves and mines, but can roost in buildings that offer suitable conditions. Night roosts are in more open settings and include bridges, rock crevices, and trees. It hibernates in mixed sex aggregations of a few to several hundred individuals. Hibernation is more prolonged in colder areas. This species arouses periodically and moves to alternative roosts and actively forages and drinks throughout the winter. Females form maternity colonies of 35 to 200 individuals, while males roost individually.

Abandoned buildings within the project site may provide suitable day roost habitat for pallid and Townsend's big-eared bats. Trees within the mixed oak woodland and mixed evergreen forest areas may provide suitable night roost habitat for these species, and pallid bats may also use eaves and awnings of buildings within and adjacent to the Project site for night roosts. These species may also forage within the Project site. The nearest CNDDB occurrence of pallid bat is reported approximately 4.5 miles from the Project site. The nearest CNDDB occurrence of Townsend's big-eared bat is located approximately 7.5 miles from the Project site. Therefore, these species have a moderate potential to occur within the Project site.

Monterey Dusky-Footed Woodrat. The Monterey dusky-footed woodrat (*Neotoma fuscipes luciana,* "MDFW") is a CDFW species of special concern. This is a subspecies of the dusky-footed woodrat (*Neotoma fuscipes*), which is common to oak woodlands throughout California. This species is frequently found in forest habitats with moderate canopy cover and a moderate to dense understory with abundant dead wood for nest construction. However, they may also be found in chaparral communities where vegetation is dense, or mixed with the taller central coastal scrub. Relatively large nests are constructed of grass, leaves, sticks, and feathers, and are built in protected spots, such as rocky outcrops or dense brambles of blackberry (*Rubus ursinus*) and/or poison oak. Typical food sources for this species include leaves, flowers, nuts, berries, and truffles. This species may be a significant food source for small- to medium-sized predators. Populations of this species may be limited by the availability of nest material. Within suitable habitat, nests are often found in close proximity to each other.

MDFW nests were observed within the mixed oak woodland habitat within the project site during 2004-2019 biological surveys. The mixed evergreen forest and maritime chaparral areas may also provide suitable habitat. Therefore, this species is assumed to be present within the Project site where suitable habitat occurs.

Mountain Lion. The southern California/central coast evolutionarily significant unit (ESU) of the mountain lion (*Puma concolor*) is a candidate for listing under CESA. The ESU is comprised of six mountain lion subpopulations: Santa Ana Mountains, Eastern Peninsular Ranges, San Gabriel/San Bernadino Mountains, Central Coast South (Santa Monica Mountains), Central Coast North (Santa Cruz Mountains), and Central Coast Central. Most of these populations appear to be struggling with low genetic diversity and effective population sizes, which puts them at increased risk of extinction (Center for Biological Diversity [CBD] and the Mountain Lion Foundation [MLF], 2019). Mountain lions require large areas of relatively undisturbed habitats with adequate connectivity to allow for dispersal and gene flow. Mountain lions have large home ranges that include a variety of vegetation types, including pine forests, riparian and oak woodlands, chaparral, and grasslands; however, desert habitats are also used. This species will use moderately disturbed areas as they travel and hunt; however, they generally avoid areas with human disturbance. Mountain lions are polygamous breeders and may reproduce at any time of the year, although kitten births are most common between April and September. Females keep their kittens in dens located in rocky terrain or in dense vegetation, and may move to several different dens until the kittens are weaned at about two to three months old (CBD and MLF, 2019). Mountain lions are opportunistic predators and have been documented to eat a wide variety of prey; however, large ungulates, such as deer, are preferred (CBD and MLF, 2019).

The oak woodland, mixed evergreen forest, and chaparral habitat within the project site may provide suitable hunting and dispersal habitat for mountain lions. However, due to the level of human disturbance within and adjacent to the Project site, this species is unlikely to use to Project site for denning. The CNDDB does not document occurrences of this species; however, this species is known to occur through Monterey and Santa Cruz Counties. Therefore, mountain lions have a moderate potential to occur within the Project site.

California Tiger Salamander. The California tiger salamander (*Ambystoma californiense,* "CTS") is a federal and state threatened species. It was listed as a federally threatened species on August 4, 2004 (69 FR 47211-47248), and its critical habitat was designated on August 23, 2005 (70 FR 49379-49458). It was listed as a state threatened species on March 3, 2010. CTS is a large, stocky salamander most commonly found in annual grassland habitat, but also occurring in the grassy understory of valley-foothill hardwood and chaparral habitats, and uncommonly along stream courses in valley-foothill riparian habitats (Service, 2004). Adults spend most of their lives underground, typically in burrows of ground squirrels and other animals (Service, 2004). CTS has been extirpated from an estimated 55 percent of its documented historic breeding sites. Currently, about 150 known populations of California tiger salamanders remain. CTS persists in disjunct remnant vernal pool complexes in Sonoma County and Santa Barbara County, in vernal pool complexes and isolated stockponds scattered along a narrow strip of rangeland on the fringes of the Central Valley from southern Colusa County south to northern Kern County, and in sag ponds and human-maintained stockponds in the coast ranges from the San Francisco Bay Area south to the Temblor Range.

Above-ground migratory and breeding activity may occur under suitable environmental conditions from mid-October through May. Adults may travel long distances between upland and breeding sites; adults have been found more than 1.24 miles (2.2 km) from breeding sites (Service, 2004). Breeding occurs from November to February, following relatively warm rains (Stebbins, 2003). CTS breeds and lays eggs primarily in vernal pools and other temporary rainwater ponds. Permanent human-made ponds are sometimes utilized if predatory fishes

are absent; streams are rarely used for reproduction. Eggs are laid singly or in clumps on both submerged and emergent vegetation and on submerged debris in shallow water (Stebbins, 1972; Jennings and Hayes, 1994). Males typically spend six to eight weeks at breeding ponds, while females typically spend only one to two weeks (Loredo et al., 1996). Eggs hatch within 10 to 14 days (Service, 2004) and a minimum of 10 weeks is required to complete development through metamorphosis (Jennings and Hayes, 1994); however, the larval stage may last up to six months and some larvae in Contra Costa and Alameda Counties may remain in their breeding sites over the summer (Service, 2004).

Suitable upland and dispersal habitat for CTS are present within the Project site. The ruderal drainage basin does not have a sufficient hydroperiod to support breeding for this species and no other suitable breeding habitat is present within the site. However, a potential breeding pond is located less than 200 feet from the Project site on an adjacent property, and other potential breeding resources are present within the dispersal distance for this species. The CNDDB reports three occurrences within 1.24 miles (2.2 km) of the Project site, the nearest of which is a 2016 sighting of an adult CTS located approximately 0.6 miles (1.0 km) from the Project site. The nearest reported breeding occurrence is a 1990 occurrence located approximately 0.8 miles (1.3 km) south of the Project site. Therefore, due to known occurrences of this species within dispersal distance 1.2 miles (2.2 km) of the Project site, the presence of a potential breeding pond less than 200 feet from the Project site, and the presence of other potential breeding resources within the dispersal distance, CTS has a moderate potential to utilize the Project site as upland and dispersal habitat.

California Legless Lizard. The California legless lizard (*Anniella pulchra*) is a fossorial (burrowing) species that typically inhabits sandy or loose (friable) soils. Habitats known to support this species include (but are not limited to) coastal dunes, valley and foothill grasslands, chaparral, and coastal scrub at elevations from near sea level to approximately 6000 feet (1800 meters). The California legless lizard forages on invertebrates beneath the leaf litter or duff layer at the base of bushes and trees or under wood, rocks, and slash in appropriate habitats. Little is known about the specific habitat requirements for courtship and breeding; however, the mating season for this species is believed to begin late spring or early summer, with one to four live young born between September and November. The diet of this species likely overlaps to some extent with that of juvenile alligator lizards and perhaps some other salamanders. California legless lizards eat insect larvae, small adult insects, and spiders. This species may be preyed upon by alligator lizards, snakes, birds, and small mammals.

Suitable habitat for California legless lizard is present within the Project site where suitable conditions occur (e.g., suitable soils, leaf litter or duff below bushes and trees). The nearest CNDDB occurrence is approximately 4.4 miles from the Project site. Therefore, this species has a moderate potential to occur within the Project site.

Coast Horned Lizard. The coast horned lizard (*Phrynosoma blainvillii*) is a CDFW species of special concern. Horned lizards occur in valley-foothill hardwood, conifer, and riparian habitats, as well as in pine-cypress, juniper, chaparral, and annual grass habitats. This species generally inhabits open country, especially sandy areas, washes, flood plains, and wind-blown deposits in a wide variety of habitats. Coast horned lizards rely on camouflage for protection and will often lay motionless when approached. Horned lizards often bask in the early morning on the ground or on elevated objects such as low boulders or rocks. Predators and extreme heat are avoided by burrowing into loose soil. Periods of inactivity and winter hibernation are spent burrowed into the soil or under surface objects. Little is known about the habitat requirements for breeding and egg-laying of this species. Prey species include ants, beetles, wasps, grasshoppers, flies, and caterpillars.

Suitable habitat for coast horned lizard is present within the maritime chaparral and annual grassland areas of the project site. The mixed evergreen forest may also provide marginal habitat for this species. The nearest CNDDB occurrence is approximately 11 miles from the Project site. Therefore, this species has a moderate potential to occur within the Project site.

California Red-Legged Frog. The California red-legged frog (*Rana draytonii*, "CRLF") is a federally threatened species and a CDFW species of special concern. It was listed as a threatened species on June 24, 1996 (61 FR 25813-25833), and its critical habitat was designated on April 13, 2006 (71 FR 19244-19346) and revised on March 17, 2010 (75 FR 12816-12959). The CRLF is the largest native frog in California (44-131 mm snout-vent length) and was historically widely distributed in the central and southern portions of the state (Jennings and Hayes, 1994). Adults generally inhabit aquatic habitats with riparian vegetation, overhanging banks, or plunge pools for cover, especially during the breeding season (Jennings and Hayes, 1988). They may take refuge in small mammal burrows, leaf litter, or other moist areas during periods of inactivity or to avoid desiccation (Rathbun, et al., 1993; Jennings and Hayes, 1994). Radio telemetry data indicates that adults engage in straight-line breeding season movements irrespective of riparian corridors or topography and they may move up to one mile (or 1.6 km) between non-breeding and breeding sites (Bulger et. al., 2003).

This species requires still or slow-moving water during the breeding season where it can deposit large egg masses, which are most often attached to submergent or emergent vegetation. Breeding typically occurs between December and April, depending on annual environmental conditions and locality. Eggs require six (6) to 12 days to hatch and metamorphosis generally occurs after 3.5 to seven months, although larvae are also capable of over-wintering. During the non-breeding season, CRLFs use a wider variety of aquatic habitats, including small pools in coastal streams, springs, water traps, and other ephemeral water bodies (Service, 1996). The CRLF may also move up to 300 feet from aquatic habitats into surrounding uplands, especially following rains, where individuals may spend days or weeks (Bulger et al., 2003).

Suitable upland and dispersal habitat for CRLF are present within the project site. The ruderal drainage basin does not have a sufficient hydroperiod to support breeding for this species and no other suitable breeding habitat is present within the site. However, a potential breeding pond is located less than 200 feet from the Project site on an adjacent property. The nearest CNDDB occurrence is a 1990 breeding observation located approximately 0.75 miles from the Project site within a spring-fed pond. Therefore, due to known occurrences of this species within one mi of the Project site and the presence of a potential breeding pond less than 200 feet from the Project site, CRLF has a moderate potential to utilize the Project site as upland and dispersal habitat.

Coast Range Newt. The Coast Range newt (*Taricha torosa*) is a CDFW species of special concern. This species occurs commonly in the Coast Ranges from central Mendocino County south to northern San Diego County, primarily in valley-foothill hardwood, valley-foothill hardwood-conifer, coastal scrub, and mixed chaparral, but is also known from annual grassland and mixed conifer habitat types. The elevation range extends from sea level to 6,000 feet. Juveniles and terrestrial adults prey on earthworms, snails, slugs, sowbugs, and insects (Stebbins, 1972). Adults at breeding ponds have been observed to take the eggs of their own species and other amphibians, as well as trout, adult and larval aquatic insects, small crustaceans, snails, and clams. Aquatic larvae eat many small aquatic organisms, especially crustaceans. Terrestrial individuals seek cover under surface objects, such as rocks and logs, or in mammal burrows, rock fissures, or human-made structures, such as wells. Aquatic larvae find cover beneath submerged rocks, logs, debris, and undercut banks. Breeding and egg-laying occur in intermittent streams, rivers, permanent and semi-permanent ponds, lakes, and large reservoirs. Eggs

are laid in small clusters on the submerged portion of emergent vegetation, on submerged vegetation, and on the underside of rocks off the bottom. Terrestrial individuals are relatively inactive in subterranean refuges most of the year. Migrations to and from breeding areas usually occur at night during or just following rains.

Suitable upland and dispersal habitat for Coast Range newt are present within the Project site. No suitable breeding habitat is present within the site; however, a potential breeding pond is located less than 200 feet from the Project site on an adjacent property. The nearest CNDDB occurrence is a 2001 observation of 500 breeding adults located approximately 1.3 miles from the Project site. Therefore, Coast Range newt has a moderate potential to utilize the Project site as upland and dispersal habitat.

Crotch Bumble Bee and Western Bumble Bee. The Crotch bumble bee (*Bombus crotchii*, CBB) was historically common in the southern two-thirds of California, but now appears to be absent from most of it, especially in the center of its historic range (Xerces Society for Invertebrate Conservation [The Xerces Society] et, al., 2018). The western bumble bee (*B. occidentalis*, WBB) was formerly common from the Pacific coast to the Colorado Rocky Mountains; however, populations from central California to southern British Columbia, Canada and west of the Sierra-Cascade Ranges have declined sharply since the late 1990s (Koch et. al., 2012; Williams et. al., 2014). On March 16, 2016, the Service announced that a petition to list CBB and WBB under the ESA presented substantial scientific or commercial information indicating that the petitioned action may be warranted, and identified these species as "Under Review." Additionally, on June 28, 2019, the CDFW determined that the petition to list CBB and WBB under CESA provided sufficient scientific information to indicate the petitioned action may be warranted, and identified these species as a "Candidate" for listing (CDFW, 2019).

Typical habitat types for CBB and WBB include open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows where abundant floral resources are present (Williams et. al., 2014; The Xerces Society et, al., 2018). CBB and WBB require plants that bloom and provide adequate nectar and pollen throughout the colony's life cycle, which is from early February to late October or November, respectively. Both species are generalist foragers and has been reported to visit a wide variety of flowering plants; however, both have a very short tongue that is best suited to open flowers with short corollas. The plant families most commonly associated with CBB include Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, and Boraginaceae. Select food genera for WBB include, but is not limited to, *Ceanothus, Geranium, Grindelia, Lupinus, Monardella, Rubus, Solidago, Melilotus, Cirsium, Trifolium, Centaurea, Chrysothamnus, Penstemon,* and *Eriogonum* (Koch et. al., 2012; Williams et. al., 2014; The Xerces Society et, al., 2018).

Like most other species of bumble bees, CBB and WBB typically nest underground. Most reports of nests are from underground cavities, such as old squirrel or other animal nests, and in open west-southwest slopes bordered by trees. A few nests have also been reported from above-ground locations such as in logs among railroad ties or under buildings (Hatfield et. al,, 2015; The Xerces Society et, al., 2018; Thorpe et. al., 1983). Very little is known about overwintering sites utilized by most bumble bees, including CBB and WBB; however, they generally overwinter in soft, disturbed soil or under leaf litter of other debris (Goulson, 2010; Williams et. al., 2014; The Xerces Society et, al., 2018). One report identified that hibernacula was two inches deep "in a steep west slope of the mound of earth" and a closely related European species, has been reported to hibernate beneath trees (Hatfield et. al,, 2015; The Xerces Society et, al., 2018). Additionally, a recent study at the former Fort Ord on the Monterey Peninsula that studied potential overwintering habitat found individuals of two species (*B. melanopygus* and *B. vosnesenskii*) hibernating in the duff below Monterey cypress trees, while none were

observed in areas where the groundcover consisted of pine needle duff, grassy meadow, or the invasive iceplant (Williams et. al., 2019).

The Project site is within the historic range of CBB and WBB; however, it is outside of the currently known range for these species as shown on CDFW's Biogeographic Information and Observation System. Suitable foraging and nesting habitat for CBB and WBB is present within Project site. The presence of grassland and chaparral habitats likely indicate that adequate nectar and pollen resources are available throughout a colony's lifecycle. Therefore, these species have a moderate potential to occur within the Project site.

Raptors and Other Nesting Birds. Raptors, their nests, and other nesting birds are protected under the MBTA and California Fish and Game Code. While the life histories of these species vary, overlapping nesting and foraging similarities allow for their concurrent discussion. Most raptors are breeding residents throughout most of the wooded portions of the state. Stands of live oak, riparian deciduous, or other forest habitats, as well as open grasslands, are used most frequently for nesting. Breeding occurs from February through September, with peak activity in May through July. Prey for these species include small birds, small mammals, and some reptiles and amphibians. Many raptor species hunt in open woodland and habitat edges.

Various species of raptors and other nesting birds, such as red-tailed hawk, American kestrel, red-shouldered hawk (*B. lineatus*), great horned owl (*Bubo virginianus*), turkey vulture (*Cathartes aura*), American crow, barn owl (*Tyto alba*), tree swallow (*Tachycineta bicolor*), and the special-status white-tailed kite (*Elanus leucurus*) have the potential to nest within any of the large trees present within and adjacent to the project site. Other smaller avian species may also nest within the maritime chaparral and annual grassland habitats, including the special-status loggerhead shrike (*Lanius ludovicianus*). The nearest CNDDB occurrence of white-tailed kite is approximately 1.7 miles from the Project site and several occurrences of this species are reported in eBird. The CNDDB does not report any occurrences of loggerhead shrike in the quadrangles evaluated; however, several occurrences of this species are also reported in eBird. Therefore, these species, as well as raptors and other nesting birds, have a moderate to high potential to occur within the Project site.

4.3.3.3 Sensitive Habitats

Maritime Chaparral

The Project site contains approximately 8.6 acres of maritime chaparral, which is designated as a sensitive habitat by CDFW and the Monterey County General Plan. Approximately 3.6 acres of this habitat would be impacted by the Project; the remaining 5.0 acres would be protected in place within the proposed conservation easements. The historic conversion of the majority of the maritime chaparral habitat within the Project site to agricultural land and continued maintenance (e.g., mowing and grubbing) has resulted in a dominance of non-native, invasive species, including annual grasses, iceplant, and jubata grass. Because these disturbed areas are no longer dominated by maritime chaparral species, the disturbed maritime chaparral/annual grassland mix within the Project site is not considered a sensitive habitat.

4.3.3.4 Trees

The Staub FMP describes the Project site as displaying a history of the introduction of numerous exotic tree species as well as regionally common trees which are not native to the site. The most prominent non-native trees on the site are Monterey pines, eucalyptus, and coast redwoods. In 2006, Monterey pine dominated portions of lots 1, 5, 6, 16, 18, and 19. Eucalyptus dominated portions of lots 11, 13, 15, 16, 17, and 18. Coast

redwoods appear to have been planted on lots 1, 6, and 11, and had survived in small groves. Monterey pine had also been planted as a boundary fence along the eastern property boundary and short portion of the western property boundary. A large stand of coast live oak forest remained within lots 1, 3, 4, 5, and 7, which reflects the capability of the site to support a fairly dense and vigorous native tree canopy. The FMP documented that the coast live oak trees on the site were generally thriving where they were not competing with non-native tree species.

In the years since the Staub FMP was prepared, some areas of the Project site have been subject to encroachment of non-native trees (eucalyptus and Monterey pine) into the native oak woodland; in 2019, DD&A noted a loss of approximately 3.2 acres of oak woodlands since the Staub FMP was prepared in 2006. In addition, and as described in the updated FMP (DD&A, 2021), oak woodland conditions have degraded since the Staub FMP from "good" (little appearance of decay or disease, good canopy development and color) to "fair" (thriving, with minor evidence of decay or disease and less than 30% foliar dieback). Abiotic stressors identified in 2019 include the lack of sufficient hydrology associated with drought conditions. Biotic stressors identified in the Staub FMP, including native oak pathogens and pitch canker (*Fusarium circinatum*), were confirmed during the 2019 site visit. Additional biotic stressors, including oak branch canker *(Diplodia quercina*), phytophthora root/crown rot, oak ambrosia beetles *(Monarthrum spec*ies), and oak bark beetles *(Pseudopityophthorus spec*ies) were also identified in 2019. In addition, DD&A observed a lack of oak seedlings or saplings within the project site. Factors deterring regeneration include, but are not limited to, wildlife browsing, avian and rodent predation, and competition for moisture with non-native annual grasses. Sampling consisted of randomly measuring tree density by diameter class across the range of oak woodland cover types within the project site. Results of the sampling effort were extrapolated over the acreage of oak woodland identified within the site in 2006 to estimate tree population. Although these estimates are based on data collected by Staub in 2006, the lack of oak seedlings and saplings observed within the site suggests that natural recruitment of trees within the site has been minimal. In addition, DD&A noted an approximately 3.2 acres loss of oak woodland habitat between 2006 and 2019. Therefore, it is assumed that fewer native oaks and more non-native species currently occur within the Project site. However, for the purposes of this analysis and for a conservative estimate on the number of native trees within the site, this analysis assumes that the number of trees within the Project site across all species and diameter classes is approximately the same as was estimated in 2006.

Based on the combination of sampling and tallies conducted by Staub in 2006, **Table 4.3-4** estimates the tree population on the property by species and diameter class.

Table 4.3-4
Estimated Native and Non-Native Tree Population

Tree Type	6-11 Diameter Class (inches)	12-23 Diameter Class (inches)	23+ Diameter Class (inches)
Coast live oak	1,142	534	32
Monterey pine	69	98	79
Eucalyptus	18	34	12
Coast redwood	9	13	0
Total	**1,238**	**679**	**123**

4.3.4 REGULATORY ENVIRONMENT

4.3.4.1 Federal

Federal Endangered Species Act. Provisions of the ESA of 1973 (16 USC 1532 et seq., as amended) protect federally listed threatened or endangered species and their habitats from unlawful take. Listed species include those for which proposed and final rules have been published in the Federal Register. The ESA is administered by the Service or National Oceanic and Atmospheric Administration ("NOAA") National Marine Fisheries Service ("NMFS"). In general, NMFS is responsible for the protection of ESA-listed marine species and anadromous fish, whereas other listed species are under Service jurisdiction.

Section 9 of ESA prohibits the take of any fish or wildlife species listed under ESA as endangered or threatened. Take, as defined by ESA, is "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the fish or wildlife…including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife." In addition, Section 9 prohibits removing, digging up, and maliciously damaging or destroying federally listed plants on sites under federal jurisdiction. Section 9 does not prohibit take of federally listed plants on sites not under federal jurisdiction. If there is the potential for incidental take of a federally listed fish or wildlife species, take of listed species can be authorized through either the Section 7 consultation process for federal actions or a Section 10 incidental take permit process for non-federal actions. Federal agency actions include activities that are on federal land, conducted by a federal agency, funded by a federal agency, or authorized by a federal agency (including issuance of federal permits).

Migratory Bird Treaty Act. The MBTA of 1918 prohibits killing, possessing, or trading migratory birds except in accordance with regulation prescribed by the Secretary of the Interior. Most actions that result in permanent or temporary possession of a protected species constitute violations of the MBTA. The Service is responsible for overseeing compliance with the MBTA and implements Conventions (treaties) between the United States and four countries—Canada, Mexico, Japan, and Russia—for the protection of migratory birds. The Service maintains a list of migratory bird species that are protected under the MBTA.

4.3.4.2 State

California Endangered Species Act. The CESA was enacted in 1984. The California Code of Regulations (Title 14, §670.5) lists animal species considered endangered or threatened by the state. Sec. 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. Sec. 2080 of the Fish and Game Code prohibits "take" of any species that the commission determines to be an endangered species or a threatened species. "Take" is defined in Sec. 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." A Section 2081 Incidental Take Permit from the CDFW may be obtained to authorize "take" of any state listed species.

California Native Plant Protection Act. The CNPPA of 1977 directed CDFW to carry out the legislature's intent to "preserve, protect and enhance rare and Endangered plants in the State." The CNPPA prohibits importing rare and Endangered plants into California, taking rare and Endangered plants, and selling rare and Endangered plants. The CESA and CNPPA authorized the Fish and Game Commission to designate endangered, threatened, and rare species and to regulate the taking of these species (Sec. 2050-2098, Fish and

Game Code). Plants listed as rare under the CNPPA are not protected under CESA; however, these plants may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research.

California Fish and Game Code. Sec. 3503 of the Fish and Game Code states that it is "unlawful 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." Sec. 3503.5 prohibits the killing, possession, or destruction of any birds in the orders Falconiformes or Strigiformes (birds-of-prey). Sec. 3511 prohibits take or possession of fully protected birds. Sec. 3513 prohibits the take or possession of any migratory nongame birds designated under the federal Migratory Bird Treaty Act. Sec. 3800 prohibits take of nongame birds.

The classification of Fully Protected was the state's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish (Sec. 5515), mammals (Sec.4700), amphibians and reptiles (Sec.5050), and birds (Sec.3511). Most Fully Protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.

The CDFW also maintains a list of wildlife "species of special concern." Although these species have no legal status, the CDFW recommends considering these species during analysis of project impacts to protect declining populations and avoid the need to list them as endangered in the future.

CDFW has jurisdiction over the conservation, protection, and management of wildlife, native plants, and habitat necessary to maintain biologically sustainable populations (Sec.1802). As a trustee agency under CEQA Guidelines Section 15386, CDFW provides expertise in reviewing and commenting on environmental documents and provides protocols regarding potential negative impacts to those resources held in trust for the people of California.

4.3.4.3 Local

Monterey County 1982 General Plan. The County of Monterey General Plan provides policies for the protection of biological resources. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing** for a detailed analysis of the project's consistency with the County's General Plan policies for biological resources. Relevant policies are listed below:

7.1.1 Development shall be carefully planned in, or adjacent to, areas containing limited or threatened plant communities and shall provide for the conservation and maintenance of the plant communities.

7.1.2 The County shall encourage the protection of limited or threatened plant communities through dedications of permanent scenic easements and other appropriate means.

7.2.2 Native and native compatible species, especially drought resistant species, shall be utilized to the extent possible in fulfilling landscaping requirements imposed as conditions of discretionary permits.

9.1.1 Development shall be carefully planned in areas known to have particular value for wildlife and, where allowed, shall be located so that the reasonable value of the habitat for wildlife is maintained.

9.1.2 Development shall be carefully planned in areas having high value for fish and wildlife reproduction.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the area. The NCAP includes policies related to biological resources. Please refer to **Table 4.10-5** in **Section 4.10 Land Use, Population, and Housing** for a detailed analysis of the Project's consistency with applicable NCAP policies related to biological resources policies. Relevant policies are listed below:

7.1.3 (NC) To retain the viability of threatened or limited vegetative communities and animal habitats, to promote the area's natural scenic qualities, and to preserve rare, endangered, and endemic plants for scientific study, the conservation of North County's remaining tracts of native vegetation shall be given high priority.

7.2.2.1 (NC) The County shall discourage the planting of non-native, invasive plant species and shall disallow the use of these plants in fulfilling landscaping or revegetation requirements imposed as conditions of discretionary permits.

7.2.3 (NC) Property owners shall be encouraged to cooperate with the County in establishing scenic easements over areas of native vegetation.

8.2.1 (NC) The County shall discourage the removal of healthy, native oak and madrone tress in North Monterey County. A permit shall be required for the removal of any of these trees with a trunk diameter in excess of six inches, measure two feet above ground level. Where feasible, trees removed will be replaced by nursery-frown trees of the same species and not less than one gallon in size. A minimum fine, equivalent to the retail value of the wood removed, shall be imposed for each violation. In the case of emergency caused by the hazardous or dangerous conditions of a tree and requiring immediate action for the safety of life or property, a tree may be removed without the above permit, provided the County is notified of the action within ten working days. Exemptions to the above permit requirement shall include tree removal by public utilities, as specified in the California Public Utility Commissions' General Order 95, and by governmental agencies.

Monterey County Code. Title 16, Chapter 16.60, and Title 21 Sec. 21.64.260 of the Monterey County Code, provides for the preservation of oaks and other protected tree species within the unincorporated areas of the County. As defined in Sec.16.60.030.D and 21.64.260.C.1, no oak or madrone tree six inches or more in diameter two feet above ground level shall be removed in the NCAP without a permit. In addition, no landmark oak tree shall be removed in any area except as may be approved by the Director of Planning. Sec.16.60.030.E and 21.64.260.C.5 of the Monterey County Code define a landmark tree as any native oak tree that measures 24 inches or larger in diameter, measured two feet above ground. In addition, trees that are visually significant,

historically significant, or exemplary of their species are also classified as landmark trees. Special emphasis has been placed on preserving and protecting landmark trees because of their significant wildlife, scenic, or historic values.

In addition, and as defined in Sec.16.60.040.C, removal of more than three protected trees on a lot in a one-year period requires preparation of a FMP and approval of a Use Permit by the Monterey County Planning Commission. The FMP must be prepared by a qualified forester selected from the County's list of consultants. Sec.16.060.040.D and 21.64.260.D.3 require that the Applicant relocate or replace each removed tree on a one-to-one ratio. Additionally, Section E of this ordinance requires that this ratio be the minimum required on a case-by-case basis and that removal not involve a risk of adverse environmental impacts such as soil erosion.

4.3.5 IMPACTS AND MITIGATION MEASURES

4.3.5.1 Thresholds of Significance

A project impact would be considered significant if the project would:

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 CDFW or the Service;

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or the Service;

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;

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 nursery sites;

e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

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.

4.3.5.2 Areas of No Impact

c/f. *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; and, conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.* The ruderal drainage basin within the Project site does not have sufficient hydrology to support substantial hydrophytic vegetation and therefore does not meet the definition of a state or federal wetland. Therefore, no state or federally protected wetlands occur within the Project site. In addition, the Proposed Project is not located within the boundaries of a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. No impact would occur.

4.3.5.3 Impact Analysis

Impact BIO-1: The Proposed Project may result in direct and indirect impacts to special-status plants and wildlife, sensitive habitats, and protected trees. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criteria a, b, and e).

The Proposed Project may result in direct and indirect impacts to special-status plants and wildlife, sensitive habitats, and protected trees. Specific impacts to each of these sensitive natural resources is discussed below and include, but are not limited to, mortality of individuals, disturbance, and loss of habitat. **These are considered potentially significant impacts that can be mitigated to a less than significant level through the implementation of Mitigation Measures BIO-1a through BIO-1e, in addition to the resource-specific measures identified below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure BIO-1a:

A deed restriction shall be recorded for each lot establishing conservation easements in all areas outside of the building/sceptic envelopes, utility easements, detention basins, and other areas planned for subdivision improvements to ensure the long-term protection of the maritime chaparral habitat and/or special-status plant species that:

- Prohibits grading, structures, roads, water tanks, surface or subsurface utility lines, or other activities except as may be necessary to reduce the potential risk of wildfires as outlined in the Conservation Easement Habitat Management and Enhancement Plan (see **Mitigation Measure BIO-2c**), to implement the Conservation Easement Habitat Management and Enhancement Plan and/or, with the written approval of a biologist and HCD – Planning Services, to locate utility improvements if necessary to avoid other environmental impacts or construction on grades over 25 percent, and if no significant impact to biological resources would result.
- Prohibits the property owner from removing native vegetation and trees, including animal grazing, except as may be necessary during an emergency; to implement the Restoration and Management Plan outlined in **Mitigation Measure BIO-2b** and/or the Conservation Easement Habitat Management and Enhancement Plan outlined in **Mitigation Measure BIO-2c** (e.g., to restore or maintain the vigor, diversity, and value of the habitat; to remove non-native plants; to reduce the potential risk of wildfires; or to otherwise ensure the long-term maintenance of the habitat); with the written approval of a biologist and HCD – Planning Services, to locate utility improvements if necessary to avoid other environmental impacts or construction on grades over 25 percent, and if no significant impact to biological resources would result; or otherwise deemed necessary unless approved in writing by the HCD – Planning Services.
- Prohibits motor vehicle and bicycle use, pets, storage, dumping, or any other activities within the conservation easements that could adversely affect the ecological and scenic importance of these easements.

- Discloses to purchasers the ecological and scenic importance of the conservation easements, the presence of special-status plants, and habitat protection measures implemented as part of the development.

Prior to recordation of the final map, the Applicant shall submit to the HCD – Planning Services evidence of the deed restriction consistent with this mitigation measure for review and approval.

Mitigation Measure BIO-1b:

An Exclusionary Fencing Plan shall be prepared by a qualified biologist in order to avoid impacts to sensitive natural resources and other vegetation that are not planned to be removed or impacted by construction of proposed subdivision improvements (including vegetation removal) and lot development. The Exclusionary Fencing Plan shall include the use of temporary construction fencing or flagging, placed to keep construction vehicles and personnel from impacting special-status plant species (as identified during surveys required by **Mitigation Measure BIO-2a** below), special-status wildlife habitat (e.g., nesting birds or MDFW nests), and maritime chaparral and other vegetation outside of work limits. The Exclusionary Fencing Plan shall prohibit dumping of spoils, storage of construction materials or equipment, or disposal of construction related materials beyond the fence lines. The Exclusionary Fencing Plan shall also include requirements for supervision of fencing installation and monitoring by a qualified biologist until construction is complete.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit the Exclusionary Fencing Plan, prepared for both subdivision improvements and lot development in accordance with this mitigation, to the HCD – Planning Services for review and approval. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) and lot development, the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to monitor the installation and condition of exclusionary fencing throughout construction. Prior to commencement of vegetation removal, demolition, and/or grading activities, the Applicant shall submit evidence of implementation of the approved Exclusionary Fencing Plan. The Applicant shall submit monthly monitoring reports during construction to the HCD – Planning Services documenting that protective fencing or flagging is intact. The monitoring reports may be combined with the monthly monitoring reports required by **Mitigation Measure BIO-1e**.

Mitigation Measure BIO-1c:

The Applicant shall prepare a Landscaping Plan that maximizes the use of locally occurring, native plants. The Applicant shall not use species in landscaping that are listed on the California Invasive Plant Council's Inventory of Invasive Plants. If irrigation systems are installed, they shall be designed to minimize runoff of irrigation water into adjacent areas of native vegetation subject to the approval of the County.

Prior to recordation of the final map, the Applicant shall submit to the HCD – Planning Services evidence that final map includes a note requiring preparation of a Landscaping Plan in accordance with the mitigation above.

Prior to the issuance of a building permit for subdivision improvements or lot development, the Applicant shall submit a Landscaping Plan, prepared in accordance with this mitigation, to the HCD – Planning Services for review and approval. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Mitigation Measure BIO-1d:

A qualified biologist shall conduct an Employee Education Program for the construction crew (including subcontractors) prior to initiation of construction activities for subdivision improvements (including vegetation removal) or lot development. The qualified biologist shall meet with the construction crew at the onset of construction at the project site to educate the construction crew on the following: 1) the appropriate access route(s) in and out of the construction area and review project boundaries; 2) how a biological monitor will examine the area and agree upon a method which will ensure the safety of the monitor during such activities; 3) the identification of special-status species and other sensitive natural resources that may be present; 4) the specific mitigation measures that will be incorporated into the construction effort; 5) the general provisions and protections afforded; and 6) the proper procedures if a special-status species is encountered within the project site to avoid impacts.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) or lot development, the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct an Employee Education Program. The Applicant shall also submit a copy of the education program materials to the HCD – Planning Services for review and approval prior to implementation. Within one week of the commencement of these activities, the Applicant shall submit evidence to the HCD – Planning Services documenting that the education program took place. This evidence shall be in the form of a signed list of attendees. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Mitigation Measure BIO-1e:

The following best management practices ("BMPs") shall be implemented throughout the duration of construction activities for subdivision improvements (including vegetation removal) and lot development:

- Grading, excavating, and other activities that involve substantial soil disturbance shall be planned and carried out in consultation with a qualified hydrologist, engineer, or erosion control specialist, and shall utilize standard erosion control techniques to minimize erosion and sedimentation to native vegetation.
- To prevent inadvertent entrapment of special-status wildlife species during project construction, all excavated, steep-walled holes or trenches more than two feet deep will be covered at the close of each working day with plywood or similar materials. Before such holes

or trenches are filled, they will be thoroughly inspected for trapped animals. For holes and trenches that it is infeasible to cover, the sidewalls may be a 2:1 slope or greater, or ramps may be placed to allow animals to escape.

- Only tightly woven fiber netting or similar material may be used for erosion control at the project site. Coconut coir matting is an acceptable erosion control material. No plastic mono-filament matting will be used for erosion control, as this material may ensnare wildlife, including special-status species.
- Because dusk and dawn are often the times when many special-status wildlife species are most actively foraging and dispersing, all construction activities shall cease one half hour before sunset and shall not begin prior to one half hour after sunrise.
- All trash that may attract predators shall be properly contained, removed from the construction site, and disposed of weekly. Following construction, all trash and construction debris shall be removed from work areas.
- No construction equipment shall be stored, serviced, or fueled outside of designated staging areas.
- No pets or firearms shall be allowed on the project site during construction.
- The qualified biologist and the construction monitor shall complete a daily log summarizing activities and environmental compliance throughout the duration of the proposed project.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) and lot development, the Applicant shall include the requirements of this mitigation measure as notes on the construction drawings. During all construction activities, the Applicant shall submit monthly monitoring reports to the HCD – Planning Services summarizing daily construction activities and environmental compliance. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Impact BIO-2: The Proposed Project may result in direct impacts to Hickman's onion, Anderson's manzanita, Hooker's manzanita, Pajaro manzanita, sandmat manzanita, Monterey spineflower, Eastwood's goldenbush, Kellogg's horkelia, marsh microseris, northern curly-leaved monardella, Dudley's lousewort, Yadon's rein orchid, saline clover, and Choris's popcornflower, if present within or directly adjacent to the construction footprint. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criterion a).

Several special-status plant species, including Anderson's manzanita, Hooker's manzanita, Pajaro manzanita, sandmat manzanita, and Yadon's rein orchid were identified within the Project site during focused botanical surveys conducted between 2004 and 2016, see **Table 4.3-2** for a list of surveys completed. No additional focused botanical surveys were completed as part of subsequent survey efforts. Two (2) Hooker's manzanita individuals and 35 Yadon's rein orchid individuals were mapped within the site in 2016. Anderson's manzanita, Pajaro manzanita, and sandmat manzanita were observed within the Project site but were not mapped. Because focused botanical surveys were conducted more than three years ago, the distribution of special-status plant species which were previously identified within the Project site has likely changed. Therefore, for the purposes

of this analysis, any of these species may occur within any area of the Project site where suitable habitat is present.

In addition, the Project site provides suitable habitat for Hickman's onion, Monterey spineflower, Eastwood's goldenbush, Kellogg's horkelia, marsh microseris, northern curly-leaved monardella, Dudley's lousewort, saline clover, and Choris's popcornflower. Most of these species are associated with maritime chaparral, but some may also occur in oak woodland, grassland, or ruderal (drainage basin) habitats. These species were not observed within the Project site during focused botanical surveys between 2004 and 2016; however, surveys were conducted more than three years ago and may not reflect current site conditions. Therefore, these species may occur within any area of the Project site where suitable habitat is present.

The Project could result in direct impacts to these species, including loss of habitat and mortality of individuals, if present within or directly adjacent to the construction footprint. This analysis conservatively assumes total habitat loss associated with the subdivision improvement construction areas and future residential development of the identified building and sceptic envelopes; therefore, this analysis represents a worst-case development scenario and likely overstates anticipated impacts associated with the development of the Proposed Project. Based on this assumption, the Proposed Project would remove approximately 21.8 acres of habitat for these species (including approximately 7.7 acres of disturbed annual grassland, 4.3 acres of mixed oak woodland, 3.6 acres of maritime chaparral, 4.2 acres of mixed evergreen forest, 1.9 acres of disturbed maritime chaparral/annual grassland mix, and 0.1 acre of ruderal [detention basin]) as a result of subdivision improvements and lot development. Approximately 26.9 acres of potential habitat for these species (including approximately 7.8 acres of disturbed annual grassland, 9.1 acres of mixed oak woodland, 5.0 acres of maritime chaparral, 2.8 acres of mixed evergreen forest, 2.1 acres of disturbed maritime chaparral/annual grassland mix, and 0.1 acre of ruderal [detention basin]) would be preserved in the proposed conservation easements; however, indirect impacts to these species in the proposed conservation easements could result from increased competition with non-native, invasive plant species due to the increased proximity to disturbed areas, ongoing disturbance from residential uses, and vegetation removal to reduce wildfire risk. **These are considered potentially significant impacts that could be mitigated to a less than significant level through the implementation of the Mitigation Measures BIO-1a through BIO-1e above and Mitigation Measures BIO-2a through BIO-2c below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure BIO-2a:

Prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal), a qualified biologist shall conduct focused botanical surveys with areas of the project site that would be impacted due to ground disturbing activities (e.g., building envelopes, septic envelopes, roadways, driveways, and other areas disturbed in connection with the construction of subdivision improvements) for Hickman's onion, Anderson's manzanita, Hooker's manzanita, Pajaro manzanita, sandmat manzanita, Monterey spineflower, Eastwood's goldenbush, Kellogg's horkelia, marsh microseris, northern curly-leaved monardella, Dudley's lousewort, Yadon's rein orchid, saline clover, and Choris's popcornflower. The surveys shall be conducted during the appropriate blooming periods for these species, as determined by the qualified biologist, in areas that offer suitable habitat. The results

of the surveys shall be documented in a supplemental report. All special-status plant species shall be avoided to the greatest extent possible, as outlined in **Mitigation Measures BIO-1a, BIO-1b**, and **BIO-1d**. For special-status plant species that cannot be avoided, **Mitigation Measure BIO-2b** shall be implemented.

Prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit the results of focused botanical surveys to the HCD – Planning Services for review and approval.

Mitigation Measure BIO-2b:

Prior to recordation of the final map, impacts to special-status plant species and maritime chaparral shall be quantified based on the results of focused special-status plant surveys conducted in accordance with **Mitigation Measure BIO-2a** and habitat surveys conducted in accordance with **Mitigation Measure BIO-7a**. Impacts to special-status plant species shall be mitigated at a 3:1 ratio for individuals impacted or area impacted, as deemed appropriate by a qualified biologist or restoration specialist. To ensure that no net loss of maritime chaparral habitat as a result of the project, maritime chaparral impacts shall be mitigated through preservation of habitat, restoration of habitat, or a combination of both preservation and restoration. Habitat preservation shall be mitigated at a 2:1 ratio for area impacted, while habitat restoration shall be at a 1:1 ratio for area impacted. Habitat preservation can be satisfied through establishment of conservation easements, as identified in **Mitigation Measure BIO-1a**. The mitigation site(s) for special-status plants and maritime chaparral may be located on- or off-site, or a combination thereof and may be overlapping, as appropriate.

A Restoration and Management Plan shall be prepared by a qualified biologist prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal) that mitigates for all impacted special-status plant species and maritime chaparral habitat at the ratios identified above. The Restoration and Management Plan shall include, at a minimum, the following:

- a detailed description of on-site and/or off-site mitigation areas;
- timing for initiation of Plan activities;
- plant source material, including any soil bank salvage;
- seeding and planting specifications, including propagation of special-status plant species from on-site stock to supplement the existing populations, as appropriate;
- a monitoring program that describes annual monitoring efforts which incorporate success criteria and contingency plans if success criteria are not met; and
- frequency and format of monitoring reports to be submitted to the County.

The Restoration and Management Plan shall not be terminated until there is verification from a qualified biologist and County staff that such measures have been successfully implemented. The mitigation areas shall be preserved through establishment of conservation easements (as outlined in **Mitigation Measure BIO-1b** for on-site mitigation). Funding for implementation of this mitigation shall be secured prior to the issuance of any grading, demolition, or building permit for the subdivision improvements.

Prior to the recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall retain a qualified biologist to quantify impacts to special-status plant species and maritime chaparral habitat, and submit a Restoration and Management Plan to the HCD – Planning Services for review and approval.

The Applicant shall arrange for a qualified biologist to implement the Restoration and Management Plan. The biologist shall submit monitoring reports to the HCD – Planning Services for review and approval in accordance with the timelines specified in the Restoration and Management Plan.

Mitigation Measure BIO-2c:

Prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall retain a qualified biologist or restoration specialist to prepare a long-term Conservation Easement Habitat Management and Enhancement Plan for the conservation easement areas. The Plan shall include, at a minimum, the following:

- identification of parties responsible for implementation and management of the Plan;
- timing for initiation of Plan activities;
- identification of all competing non-native species, particularly invasive plant species;
- techniques for removing the competing species;
- specificity of measures for restoration of disturbed areas with locally-occurring native species in all appropriate areas;
- propagation of native plant species from on-site stock to supplement the existing populations, as appropriate;
- specificity of measures for vegetation removal to reduce wildfire risk in accordance with local and state policies, including, but not limited to, measures to avoid removal of special-status plant species or loss of maritime chaparral and oak woodland habitat to the extent feasible;
- applicable measures from the 2006 Staub FMP and 2021 DD&A FMP for tree protection during management and enhancement activities and oak woodland management;
- details of a monitoring plan that contain success criteria and adaptive management measures if those criteria are not met;
- frequency and format of monitoring reports to be submitted to the County; and
- identification of a funding mechanism for the monitoring and adaptive management components of the plan.

Prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit a Conservation Easement Habitat Management and Enhancement Plan, demonstrating consistency with this mitigation measure, to the HCD – Planning Services for review and approval.

The Applicant shall contract with a qualified biologist to implement the Conservation Easement Habitat Management and Enhancement Plan. The biologist shall submit an annual letter report to the

HCD – Planning Services documenting the ongoing maintenance and protection of the conservation easement areas. If annual monitoring finds that success criteria are not being met, an analysis of the cause(s) of failure shall be prepared by the qualified biologist and if determined necessary, remedial actions will occur. The analysis of the cause(s) of failure and adaptive management plan shall be included in the annual report to the County. The County shall be responsible for reviewing the annual reports to ensure that the Applicant has implemented the habitat protection and maintenance measures specified in the Conservation Easement Habitat Management and Enhancement Plan.

Impact BIO-3: The Proposed Project would require grading, excavation, and other activities that may result in a mortality or disturbance of pallid bat, Townsend's big-eared bat, MDFW, and mountain lion, if present within the project site, and in disturbance and loss of habitat. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criterion a).

Pallid bats and Townsend's big-eared bats have the potential to use trees in the mixed oak woodland and mixed evergreen forest, and eves of buildings within the Project site, for night roost habitat, and abandoned structures within the project site for day roost habitat. Direct impacts to these species, including incidental mortalities, may result from the removal of snags, older trees, and structures. Indirect impacts may include reduction of habitat because of construction and on-going reduction of habitat from residents removing trees before they can mature into snags. **These are considered potentially significant impacts that could be mitigated to a less than significant level through the implementation of Mitigation Measures BIO-1a through BIO-1e and BIO-2c above and Mitigation Measures BIO-3a and BIO-9a through BIO-9b below.**

MDFW nests were observed within mixed oak woodland areas of the Project site during biological surveys conducted between 2004 and 2019. Additional nests may occur within other areas of the Project site where suitable habitat is present (i.e., mixed evergreen forest and maritime chaparral). Direct impacts, including mortality of MDFW or nest abandonment, may result from construction of the Project. Indirect impacts to the woodrat may occur due to loss of habitat within the Project site. **These are considered potentially significant impacts that could be mitigated to a less than significant level through the implementation of Mitigation Measures BIO-1a through BIO-1e, BIO-2b, and BIO-2c above and Mitigation Measure BIO-3b and BIO-9a through BIO-9b below.**

Mountain lions have the potential to use the Project site for hunting or dispersal habitat; however, due to the level of human activity within and surrounding the project site, this species is unlikely to establish dens within the Project site. Given the large home range and mobility of this species, as well as its nocturnal tendencies, there is a low potential for mountain lion encounters during construction. However, if present, the Project could result in disturbance to individuals, and construction would result in loss of hunting and dispersal habitat. **These are considered potentially significant impacts that could be mitigated to a less than significant level through the implementation of Mitigation Measures BIO-1a through BIO-1e, BIO-2b, and BIO-2c above and BIO-9a through BIO-9b below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure BIO-3a:

To the extent practical, limbing/tree removal operations and demolition of abandoned buildings should occur between September 15 and November 1 to avoid bat maternity roosts and winter hibernacula. If tree limbing/tree removal or demolition of abandoned buildings must occur outside the period of September 15 through November 1 a survey for bats shall be conducted by a qualified biologist.

Prior to initiation of construction related activities for subdivision improvements (including vegetation removal) and lot development, a qualified biologist shall conduct a pre-construction survey for bats within development areas of the project site (i.e., building/septic envelopes, roadways, driveways, and other areas disturbed in connection with the construction of subdivision improvements) and a 50 foot buffer as follows:

- The biologist shall determine if bats are utilizing the development areas or areas within 50 feet for roosting. For any trees/snags/buildings that could provide roosting space for cavity or foliage-roosting bats, potential bat roost features shall be evaluated to determine if bats are present. Visual inspection and/or acoustic surveys shall be utilized as initial techniques. If no roosting bats are found, no additional measures are necessary. If roosting bats are found, the following shall be implemented:
    - The biologist shall develop and implement acceptable passive exclusion methods based on CDFW recommendations. If feasible, exclusion shall take place during the appropriate windows (September 15 and November 1) to avoid harming bat maternity roosts and/or winter hibernacula. (Authorization from CDFW is required to evict winter hibernacula for bats).
    - If established maternity colonies are found, in coordination with CDFW, a buffer shall be established around the colony to protect pre-volant young from construction disturbances until the young can fly; or implement other measures acceptable to CDFW.
    - If a tree is determined not to be an active roost site for roosting bats, it may be immediately limbed or removed as follows: If foliage roosting bats are determined to be present within the development areas or within 50 feet, limbs shall be lowered, inspected for bats by a bat biologist, and chipped immediately or moved to a dump site. Alternately, limbs may be lowered and left on the ground until the following day, when they can be chipped or moved to a dump site. No logs or tree sections shall be dropped on downed limbs or limb piles that have not been in place since the previous day.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) and lot development, if these activities are scheduled to occur within the bat reproductive season described above, the Applicant shall submit the results of site surveys characterizing special-status bat utilization within the project site to the HCD – Planning Services. If the results of the bat habitat characterizations surveys determine that an active special-status bat roost is present within the project site, the Applicant shall also submit the results of pre-

construction bat surveys, conducted in accordance with this mitigation, and any recommended exclusion techniques to the HCD – Planning Services for review and approval. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Mitigation Measure BIO-3b:

No more than seven days prior to construction activities for subdivision improvements (including vegetation removal) and lot development, a qualified biologist will conduct pre-construction surveys for MDFW nests within the development areas and in a buffer zone 25 feet out from the development areas, where feasible. If no MDFW nests are found, no additional measures are necessary. All nests within 25 feet of the development areas shall be flagged for avoidance and protected during project activities to the greatest extent feasible. Nests that cannot be avoided shall be manually deconstructed by a qualified biologist prior to land clearing activities to allow animals to escape harm. To the extent feasible, dismantling shall occur outside of the typical breeding season. If a litter of young is found or suspected, nest material shall be replaced, and the nest shall be left in place. A qualified biologist shall check on the nest to determine if the young are capable of independent survival before proceeding with nest dismantling.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) and lot development, the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct pre-construction surveys for MDFW. Within one week of the commencement of these activities, the Applicant shall submit the results of pre-construction surveys to HCD – Planning Services for review and shall identify in the submittal if any MDFW nests were manually deconstructed. The Applicant shall submit monthly monitoring reports during construction to the HCD – Planning Services documenting that protective fencing or flagging is intact in accordance with the Exclusionary Fencing Plan outlined in **Mitigation Measure BIO-1b**. The monitoring reports may be combined with the monthly monitoring reports required by **Mitigation Measure BIO-1e**. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Impact BIO-4: The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizards, if present within the Project site, and disturbance and loss of habitat. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criterion a).

CTS, CRLF, and Coast Range newt have the potential to utilize the Project site as upland and dispersal habitat. In addition, coast horned lizards may utilize the maritime chaparral, grassland, and mixed evergreen forest areas within the Project site, and California legless lizard may be found in any areas where suitable conditions occur (e.g., suitable soils, leaf litter or duff below bushes and trees). Grading and other earthmoving activities as a result of the Proposed Project have the potential to directly impact these species through mortality of individuals and/or loss of habitat. Mortality of CTS and/or CRLF would be considered "take" of a listed species under ESA and/or CESA and would require approval from the Service and/or CDFW. **These are considered potentially significant impacts that could be mitigated to a less than significant level through the**

implementation of Mitigation Measures BIO-1a through BIO-1e above and Mitigation Measures BIO-4a through BIO-4c below.

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure BIO-4a:

The Applicant shall comply with the ESA and CESA and contact the agencies to solicit concurrence that the project (including subdivision improvements and lot development) will not result in take or to acquire take authorization. Take authorization may require the Applicant to retain a qualified biologist to prepare a mitigation plan, which will include, but is not limited to, identifying avoidance and minimization measures, a mitigation strategy, and funding assurances. The Applicant will be required to implement the approved plan and any additional permit requirements.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation and rough grading of proposed building/septic envelopes), the Applicant shall submit to the HCD – Planning Services evidence from the USFWS and CDFW of concurrence that the project (including subdivision improvements and lot development) will not result in take or issuance of take authorization. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Mitigation Measure BIO-4b:

A qualified biologist shall survey the work area and immediately adjacent areas 48 hours before and the morning of the onset of vegetation removal, demolition activities, and/or ground-disturbing activities (associated with both subdivision improvements and lot development) for the presence of CTS, CRLF, Coast Range newt, California legless lizard, and/or coast horned lizard. If a Coast Range newt, California legless lizard, or coast horned lizard are identified within the project site, a qualified biologist shall relocate the animal to an area that offers suitable habitat at least 100 feet from the work area. If any life stage of CTS or CRLF is observed and take authorization has been acquired, relocation measures, as defined in applicable permits, shall be followed. If any life stage of CTS or CRLF is observed and take authorization has not been acquired, vegetation removal, grading and/or construction activities shall not commence until the Service and/or CDFW are consulted, and appropriate actions are taken to allow project activities to begin.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct pre-construction surveys for CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard. Within one week of the commencement of these activities, the Applicant shall submit the results of pre-construction surveys, including any consultation with the Service and/or CDFW, to HCD – Planning Services for review. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Mitigation Measure BIO-4c:

During demolition, ground disturbing activities, and vegetation removal for the construction of subdivision improvements and lot development, a qualified biologist shall survey appropriate areas of the construction site daily before the onset of work activities for the presence of CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard. The qualified biologist shall remain on site until all initial ground disturbing activities (for both subdivision improvements and lot development) are completed. If a Coast Range newt, California legless lizard, or coast horned lizard is identified within the project site, a qualified biologist shall relocate the animal to an area that offers suitable habitat at least 100 feet from the work area. If any life stage of CTS or CRLF is observed and take authorization has been acquired, relocation measures as defined in applicable permits shall be followed. If any life stage of CTS and/or CRLF is found and these individuals are likely to be killed or injured by work activities and take authorization has not been acquired, work shall stop and the Service and/or CDFW shall be contacted. Work activities shall not resume until the Service and/or CDFW is consulted and appropriate actions are taken to allow project activities to continue.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct construction-phase surveys and monitoring for CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard. The Applicant shall submit monthly monitoring reports during demolition, vegetation removal, and initial ground-disturbing activities (for both the subdivision improvements and lot development) to the HCD – Planning Services documenting the results of daily CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard surveys and any consultation with the Service and/or CDFW. The monitoring reports may be combined with the monthly monitoring reports required by **Mitigation Measure BIO-1e**. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Mitigation Measure BIO-4d:

After demolition, vegetation removal, and initial ground disturbing activities for the subdivision improvements and lot development are complete, or earlier if determined appropriate by the qualified biologist, the qualified biologist shall designate a construction monitor (a member of the construction crew) to oversee on-site compliance with all avoidance and minimization measures. The qualified biologist shall ensure that this construction monitor receives sufficient training in the identification of CTS, CRLF, Coast Range newt California legless lizard, and coast horned lizard. Thereafter the qualified biologist shall monitor the site at least weekly for the duration of ground-disturbing activities, then at least monthly following ground-disturbing activities to ensure compliance with all protective measures. The construction monitor and the qualified biologist shall be authorized to stop work if the avoidance and/or minimization measures are not being followed. If work is stopped due to the presence of CTS and/or CRLF and take authorization has not been acquired, the Service and/or CDFW shall be notified, and activities will not resume until the Service and/or CDFW are consulted and appropriate actions are taken to allow project activities to continue.

Within one week of the qualified biologist designating a construction monitor to oversee on-site environmental compliance, the Applicant shall submit evidence to the HCD – Planning Services

documenting that the construction monitor was sufficiently trained in the identification of CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard and the avoidance and minimization measures that are applicable to these species. The Applicant shall submit monthly monitoring reports during construction to the HCD – Planning Services documenting the results of daily CTS, CRLF, Coast Range newt, California legless lizard, and coast horned lizard monitoring, and any consultation with the Service and/or CDFW. The monitoring reports may be combined with the monthly monitoring reports required by **Mitigation Measure BIO-1e**. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Impact BIO-5: The Proposed Project would require grading, excavation, and other activities that may result in mortality or disturbance of raptors and other nesting birds, and loss of habitat, including, but not limited to, the special-status white-tailed kite and loggerhead shrike. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criterion a).

The special-status white-tailed kite and loggerhead shrike, and other protected avian species have the potential to nest within the Project site. Raptors and their nests are protected by CDFW Code Sec. 30503 and Sec.3503.5 and the MBTA, which protect birds of prey, their eggs and nests, and other nesting birds. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by CDFW. Any loss of fertile eggs or nests, or any activities resulting in nest abandonment, would constitute a significant impact. Construction activities, such as tree removal or site grading that disturb nesting raptors or other protected avian species on-site or immediately adjacent to the construction site, would constitute a significant impact. **These are considered potentially significant impacts that could be mitigated to a less than significant level through the implementation of Mitigation Measures BIO-1a through BIO-1e above and Mitigation Measure BIO-5a below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure BIO-5a:

To avoid impacts to nesting birds, vegetation removal, demolition activities, and construction shall commence prior to the nesting season (February 1 through September 15). If this is not possible, a pre-construction survey for nesting birds shall be conducted by a qualified biologist within 15 days prior to the commencement of these activities in all areas that may provide suitable nesting habitat within 300 feet of the project boundary. If nesting birds are identified during the pre-construction survey, an appropriate buffer, as identified by the qualified biologist, shall be imposed within which no construction activities or disturbance will take place, in accordance with the Exclusionary Fencing Plan prepared as part of **Mitigation Measure BIO-1b**. A qualified biologist shall be on-site during work re-initiation in the vicinity of the nest offset to ensure that the buffer is adequate and that the nest is not stressed and/or abandoned. No work shall proceed in the vicinity of an active nest until such time as all young are fledged, or until after September 15 (when young are assumed fledged). If construction

is halted for more than two weeks during the nesting season, a qualified biologist shall re-survey the project site prior to reinitiation of construction.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal) and lot development, if construction is scheduled to occur within the nesting bird season described above, the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct pre-construction surveys for nesting birds. Within one week of the commencement of construction, or reinitiation of construction delayed for two weeks or more during the nesting season, the Applicant shall submit the results of pre-construction surveys, if applicable, to HCD – Planning Services for review. The Applicant shall identify in the submittal if any nesting birds were identified and if any no disturbance buffer was imposed in accordance with the Exclusionary Fencing Plan prepared as part of **Mitigation Measure BIO-1b**. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Impact BIO-6: The Proposed Project would require grading, excavation, and other activities that may result in: 1) mortality or disturbance of CBB and WBB, if present within the Project site, and, 2) disturbance and loss of CBB and WBB habitat. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criterion a).

The special-status CBB and WBB have the potential to forage and nest within the Project site. Grading and other earthmoving activities as a result of the Proposed Project have the potential to directly impact these species through mortality of individuals, destruction or disturbance of nests, and/or loss of habitat. Mortality of CBB and/or WBB would be considered "take" of a listed species under CESA and would require approval from CDFW. **These are considered potentially significant impacts that could be mitigated to a less than significant level through the implementation of Mitigation Measure BIO-1a through BIO-1e above and Mitigation Measure BIO-6a below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure BIO-6a:

A qualified biologist shall conduct surveys for CBB and WBB individuals and active colonies in accordance with CDFW's *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* or the most current CDFW survey guidelines. The surveys shall be conducted within areas of appropriate habitat (foraging, nesting, and overwintering) that will be impacted by the Proposed Project and, where feasible, an approximate 50-foot buffer of those areas. Surveys shall occur during the CBB and WBB life cycle when floral resources are present (ideally during peak bloom), on sunny days with wind speeds below eight miles per hour, and at least two hours after sunrise and three hours before sunset. The surveys shall be conducted no more than two years prior to initiation of construction. If no CBB individuals or active colonies (or suspected CBB or WBB that cannot be identified) are observed during the surveys, then no additional mitigation is necessary. If CBB or WBB individuals or active colonies (or suspected CBB or WBB that cannot be identified) are observed, the

Applicant shall comply with CESA and contact CDFW to solicit concurrence that the Proposed Project will not result in take or to acquire take authorization in accordance with **Mitigation Measure BIO-4a**.

Prior to the issuance of a grading permit, demolition permit, and/or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit evidence to the HCD – Planning Services that a qualified biologist has been retained to conduct surveys for CBB and WBB. The Applicant shall submit a survey report to the HCD – Planning Services documenting the results of CBB and WBB surveys and any consultation with CDFW, as outlined in **Mitigation Measure BIO-4a**. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

Impact BIO-7: The Proposed Project would require grading, excavation, and other activities that may result in a permanent loss or disturbance of sensitive maritime chaparral habitat. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criterion b).

Approximately 5.0 acres of maritime chaparral, which is identified as sensitive on CDFW's Natural Communities List (CDFW, 2023), would be preserved within the conservation easements proposed as part of the Proposed Project. However, construction of the Proposed Project would result in the permanent removal of approximately 3.6 acres of this habitat for subdivision improvements and lot development, including proposed building/septic envelopes. **Removal of maritime chaparral habitat is considered a potentially significant impact that could be mitigated to a less than significant level through the implementation of Mitigation Measures BIO-1a through BIO-1e, BIO-2b, and BIO-2c above, and BIO-7a below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure BIO-7a:

Prior to recordation of the final map, a qualified biologist shall conduct habitat surveys of the project site to map the current extent of sensitive maritime chaparral habitat. The results of the survey shall be documented in a survey report. Avoidance of maritime chaparral habitat shall be implemented, as outlined in **Mitigation Measure BIO-1a, BIO-1b**, and **BIO-2d**. For maritime chaparral habitat that cannot be avoided, **Mitigation Measure BIO-2c** shall be implemented.

Prior to the recordation of the final map, the Applicant shall submit to the HCD – Planning Services for review and approval the results of a habitat survey that includes mapping of sensitive maritime chaparral habitat.

Impact BIO-8: Development of the Proposed Project is not expected to significantly interfere with the movement or migration patterns of fish or other wildlife. This is considered a less than significant impact and no mitigation is required. (Criterion d).

Development of the Project site is not expected to significantly interfere with the movement or migration patterns of fish as no habitat for fish species is present within the Project site. Development of the Project site

is not expected to significantly interfere with the movement or migration patterns of other wildlife due to the designation of building/sceptic envelopes and conservation easements, which will retain vegetation corridors throughout the subdivision that wildlife can move through. In addition, the remaining open space areas will connect with adjacent similar habitats that surround most of the site. An increase in the roadways and traffic within the site could be expected to result in an increase in the number of animals killed by vehicular traffic, but the roadways will not be utilized for through-traffic and vehicle strikes are not expected to significantly impact wildlife populations, and this would not be regarded as substantial interference with any established wildlife migration pattern or with wildlife movement through any identified migratory corridor. **This impact would be considered less than significant. No mitigation measures are necessary.**

Significance: Less than Significant.

Mitigation: None.

Impact BIO-9: The Proposed Project would require the removal of native trees (coast live oaks) and non-native trees (Monterey pine) within the development areas. Construction activities may result in impacts to trees not planned for removal. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criterion e).

The Project would result in significant tree removal due to subdivision improvements, expansion of North King Road, lot development. In accordance with Monterey County Code, a FMP was prepared for the Project in 2006 and updated in 2019 (Staub, 2006 and DD&A, 2021; **Appendices D and E**). The Staub FMP estimated that expansion of the road would result in the removal of 108 coast live oak trees and 41 Monterey pine trees. In addition, the Staub FMP estimated that total removal of up to 20 coast live oaks and 30 Monterey pines (non-native) may occur as a result of residential development for the Project. As described above, it is assumed that fewer native oaks and more non-native species (e.g., eucalyptus and Monterey pine) currently occur within the Project site than was estimated in 2006 due to the loss of approximately 3.2 acres of oak woodland habitat between 2006 and 2019. Because building envelopes were not identified on the vesting tentative map when the Staub FMP or the updated DD&A FMP were prepared, this analysis estimates that the number of oaks and pines that may be removed as a result of the Proposed Project is the same as was estimated in 2006 in order to provide a conservative estimate. Therefore, this analysis estimates that the Project would result in the removal of up to 128 coast live oak trees and 71 Monterey pine trees.

The Applicant would acquire a Use Permit from the County for removal of native coast live oak trees. As described earlier, Monterey pines are not native to the Prunedale area and all the Monterey pine trees on the parcel are of unknown genetic origin; therefore, none of the Monterey pines are considered special-status plant species and are not protected under the applicable tree protection ordinance for this area. However, as described in the Staub FMP, these trees provide habitat and structure within the oak woodland habitat and their removal is, thus, considered a significant impact. No tree replacement is required by ordinance for the removal of other introduced trees (e.g., eucalyptus). Removal of native oak trees and Monterey pine is considered a significant impact. **This is considered a potentially significant impact that could be mitigated to a less than significant level through the implementation of the mitigation measures identified below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure BIO-9a:

Avoidance of oak woodland and individual oak trees should be considered during the design stage for all aspects of the project in order to retain the healthy contiguous stands of the oak woodland resources within the project site. Prior to recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall retain a certified Arborist or Forester to prepare a Final FMP that identifies trees within the development areas, inventories trees necessary for removal, and outlines necessary components of the Tree Replacement Plan, as identified in **Mitigation Measure BIO-9b**, to ensure the long-term overall health of the forest. The Final FMP shall include, but not be limited to, the relevant BMPs for work near trees identified in the Staub 2006 FMP (**Appendix D**) or as updated in the DD&A 2021 FMP (**Appendix E**). A note shall be placed on the construction drawings identifying the site-specific BMPs.

Prior to the recordation of the final map or initiation of subdivision improvements (including vegetation removal), the Applicant shall retain a certified Arborist or Forester to prepare a Final FMP to determine site-specific recommendations and requirements. These recommendations may include, but are not limited to, utilization of existing trees, minimization of impacts to existing oaks, installation of screening trees, avoidance of landmark sized trees, avoidance of slopes greater than 30%, and analyzing impacts to soil from erosion. The Final FMP shall be submitted to the HCD – Planning Services for review and approval.

Prior to the issuance of a Use Permit to remove native coast live oak trees, demolition permit, grading permit, or initiation of subdivision improvements (including vegetation removal), the Applicant shall submit evidence to the HCD – Planning Services that the applicable measures in the Final FMP have been added to the construction plans.

Mitigation Measure BIO-9b:

Where tree avoidance is not feasible, tree replacement shall be implemented. All coast live oak and Monterey pine trees 6 inches or larger shall be replaced on a 1:1 basis by planting or transplanting trees in areas of suitable soil as determined appropriate by a qualified professional forester, arborist, or horticulturist. A Tree Replacement Plan shall be prepared by a qualified professional forester, arborist, or horticulturist prior to recordation of the final map. The plan shall be subject to review and approval by the HCD – Planning Services and will include the following:

- Identify tree planting areas with suitable soils that will also fulfill project landscape plans and visual screening objectives, as feasible.
- Identify monitoring requirements, such as a site inspection at the end of the first winter after planting to confirm numbers, species of replacement, and locations of plantings. Annual inspections over five years shall confirm the objective of the plan, such as the survivability of the plantings, and the percentage of healthy trees.
- At least 70 percent of the plantings shall be established/surviving by five years or monitoring (and replacement) shall continue until compliance is achieved.

- The location and species of all required replacement trees planted shall be mapped so they can be monitored for over the five-year period. The monitoring period shall be extended for individual trees that die or are in poor health and must be replaced.
- Transplanting of onsite native seedlings within construction areas and protection of those occurring near construction areas to maintain natural diversity and adaptation.
- All replacement trees shall be of local genetic stock.
- Replanting should avoid open spaces where currently there are no trees unless there is evidence of soil deep enough and of good enough quality to support the plantings.
- Most replacement shall be of a small size (cell or one gallon) as studies have shown that small trees more readily adapt to a site and grow larger over the mid-to long-term.
- Provide an adaptive management scenario if the success criteria are not being met.
- Require that tree removal of native oaks and pines 6 inches or larger for future lot construction be subject to County approval and appropriate tree replacement.

Prior to the recordation of the final map or implementation of subdivision improvements (including vegetation removal) the Applicant shall submit to the HCD – Planning Services a Tree Replacement Plan prepared by a qualified professional forester, arborist, or horticulturalist for review and approval and evidence that final map includes a note requiring implementation of the Tree Replacement Plan described in the mitigation above.

Mitigation Measure BIO-9c

To ensure that impacts to trees which are not proposed for removal are avoided or minimized to the greatest extent feasible, the best management practices ("BMPs") for work near trees identified in the Final FMP (prepared in accordance with **Mitigation Measure BIO-9a**) shall be implemented during construction. A note shall be placed on the construction drawings identifying these BMPs. A qualified biologist or arborist shall monitor all vegetation removal, demolition activities, and ground disturbing activities for the construction of subdivision improvements and lot development, and then conduct weekly monitoring throughout the duration of construction to ensure that the BMPs are implemented.

Prior to the issuance of a grading permit for the construction of subdivision improvements or lot development, the Applicant shall submit evidence to the HCD – Planning Services that the BMPs have been added to the construction plans and that a qualified biologist or arborist has been retained to monitor the project throughout the duration of construction. The Applicant shall submit monthly report during construction to the HCD – Planning Services documenting adherence to the BMPs. This mitigation measure applies to the construction of subdivision improvements and future residential buildout of the subdivision.

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4.4 CULTURAL AND TRIBAL RESOURCES

4.4.1 INTRODUCTION

This section evaluates the potential effects of the Project on cultural and tribal cultural resources. The following section 1) describes the environmental setting, 2) identifies the regulatory environment, and 3) evaluates the Proposed Project's potential adverse environmental effects and identifies the mitigation measures associated with cultural resources as they relate to the Proposed Project, where necessary. The information contained in this section is based on the results of a *Preliminary Archaeological Reconnaissance* prepared by Archaeological Consulting, Inc. (April 2007). The cultural resources investigation included an archival search of existing records, a field reconnaissance of the Project site, and assessment of potential effects on cultural resources. **Table 4.4-1** summarizes the anticipated environmental effects of the Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.4.5, Impacts and Mitigation Measures**.

Table 4.4-1
Summary of Cultural and Tribal Resources Environmental Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measures	Residual Impacts
CR-1	The Proposed Project would result in the demolition of existing on-site residences and other existing on-site improvements to accommodate development of the site. The Proposed Project would not, however, cause a substantial adverse change in significance of a historic resource as defined in §15064.5.	Less than significant	None	Less than significant
CR-2	Construction of the Project may result in the discovery and disturbance of unknown archaeological resources, and/or tribal cultural resources.	Potentially significant	CR-2a	Less than significant
CR-3	The Proposed Project could potentially affect human remains, including those interred outside of formal cemeteries.	Potentially significant	CR-2a	Less than significant
CR-4	The Proposed Project would result in ground disturbing activities. As a result, the Proposed Project could potentially affect a tribal cultural resource, defined in Public Resource Code section 21074 and that is listed or eligible for listing in the California Register of Historical Resources, or a local register of historical resources defined in Public Resources Code section 5020.1(k) and 5024.1(c).	Potentially significant	CR-2a	Less than significant

4.4.2 ENVIRONMENTAL SETTING

4.4.2.1 Regional Overview

The Project area lies within the currently recognized Native American ethnographic territory of the Costanoan Ohlone group. The Costanoan followed a hunting and gathering subsistence pattern and relied heavily on the natural acorn crop. This group lived a semi-sedentary lifestyle, generally occupying sites near the confluence of streams or near springs. Resource gathering and processing areas and associated temporary campsites are

frequently found on the coast and in other locations containing resources utilized by the group. The Costanoan traditional way of life was largely destroyed when Euro-Americans began colonizing their territory in the 1770s.

European contact began with the arrival of Spanish explorers in the 16th Century. However, it was not until 1770 that the Portola expedition arrived in Monterey Bay and established the first mission and Royal Presidio. With the arrival of the Portola expedition and the establishment of the first mission, a period of intense Native American conversion to Catholicism began. As a result, by 1778, most of the Native Americans in the region were baptized and settled around the missions to farm church lands. This resettlement marks the beginning of the disintegration of Native American traditional way of life in this area. After Mexico gained its independence from Spain in 1820, a period of secularization ensued, and the remaining Indigenous groups were employed as ranch hands and domestic servants. By 1840 many Indigenous people returned to pre-Spanish food collecting and hunting practices. As the competition for land increased with the arrival of Anglo settlers, Indigenous communities began to disappear. By the turn of the Century, vestigial Indigenous communities disappeared.

There are relatively few known archaeological sites in North Monterey County. Almost all of these are near the coast in the vicinities of the Pajaro River mouth, Elkhorn Slough, and the Old Salinas River Channel.

4.4.2.2 Local Setting

The Proposed Project site is located in an area of low archaeological sensitivity (County of Monterey, 1985). The Project area consists mainly of rolling hills supporting limited grazing and rural residential development. Vegetation in the area includes a combination of oak woodland, coast range grassland, and maritime chaparral. Rural residential uses surround the Project site, and no current agricultural uses are within the Project vicinity. Existing development on the Project site includes three (3) single-family residences (mobile homes), water tanks, and supporting structures and infrastructure. Most of the property is undeveloped and contains areas of oak woodland and maritime chaparral. Historically, the eastern portion of the Project site contained a small goat dairy and limited agricultural uses, and both of these uses no longer exist.

4.4.2.3 Preliminary Archaeological Reconnaissance

Archaeological Consulting, Inc. prepared a *Preliminary Archaeological Reconnaissance* of the Project site. As part of that analysis, Archaeological Consulting, Inc. conducted: 1) a background records search at the Northwest Regional Information Center of the California Historical Resources Information System, located at Sonoma State University, Rohnert Park; and 2) a field reconnaissance of the Project area. The following section provides a summary of the findings of the *Preliminary Archaeological Reconnaissance.*

Archaeological Consulting, Inc. conducted a records search for the Project by reviewing pertinent Northwest Regional Information Center ("NWIC") data maps, historic-period maps, and literature for Monterey County. In addition, Archaeological Consulting, Inc. also conducted a review of their existing files. No recorded cultural resources were identified on the Project site. However, two (2) recorded prehistoric archaeological sites are located within one (1) kilometer to the west of the Project site. A search of the Sacred Lands file of the Native American Heritage Commission did not find any record of Native American cultural resources in the Project area. Additionally, Archaeological Consulting, Inc. reviewed the California Inventory of Historical Resources, California Historical Landmarks, and the National Register of Historic Places to identify historic resources in the Project area, no resources were found.

Archaeological Consulting, Inc. also conducted a field reconnaissance of the Project site in April 2007. The field reconnaissance consisted of a general surface reconnaissance of all areas that could reasonably be expected to contain visible cultural resources and could be viewed without major vegetation removal or excavation. This entailed walking transects at regular intervals over the Project site. Archaeological Consulting, Inc. did not identify any materials frequently associated with prehistoric cultural resources in this area (e.g.., dark midden soil, shell fragments, bones, or bone fragments, broken or fire-altered rocks, flaked or ground stone, formal artifacts, etc.). Moreover, Archaeological Consulting, Inc. did not identify any evidence of any significant historic period archaeological resources during the course of the field reconnaissance. Archaeological Consulting, Inc. did not identify any surface evidence of any potentially significant archaeological resources.

4.4.2.4 Assembly Bill 52 – Tribal Cultural Consultation

The County sent notification letters to Tribal Representatives on August 8th, 2024. The County of Monterey HCD – Planning provided letters to the following: Ohlone Coastanoan-Esselen Nation ("OCEN"), Esselen Tribe of Monterey County, and KaKoon Ta Ruk Band of Ohlone-Costanoan Indians.

4.4.3 REGULATORY ENVIRONMENT

4.4.3.1 State

California Register of Historical Resources. California Public Resource Code ("PRC") Sec. 5024.1 established the creation of the California Register of Historical Resources ("CRHR"). The CRHR is an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change. The CRHR includes buildings, sites, structures, objects, and districts significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. The CRHR is maintained by the California Department of Parks and Recreation, Office of Historic Preservation. A historical resource may be eligible for inclusion in the CRHR if it:

1. is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. is associated with the lives of persons important in our past;
3. 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
4. has yielded, or may be likely to yield, information important in prehistory or history.

For a resource to be eligible for the California Register, it must also retain enough integrity to be recognizable as a historical resource and to convey its significance. The seven (7) aspects of integrity are: location, design, setting, materials, workmanship, feeling and association. A resource that does not retain sufficient integrity to meet the National Register criteria may still be eligible for listing in the California Register. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register if it maintains the potential to yield significant scientific or historical information or specific data (California Office of Historic Preservation, 2014).

California's list of special considerations is shorter than the criteria considerations for the National Register list. It includes some allowances for moved buildings, structures, or objects, as well as requirements for proving the significance of less than 50 years old resources and discussion of the eligibility of reconstructed buildings. Additionally, unlike the criteria considerations for the National Register, cemeteries do not come under the scrutiny of special considerations for the California Register. In addition to separate evaluations for eligibility for the California Register, the State automatically lists resources that are listed or formally determined eligible for the National Register in the California Register. No structures are the Project site are eligible for inclusion on the California Register.

California Environmental Quality Act. CEQA requires that public agencies consider the potential environmental effects of their actions on historical resources, unique archaeological resources. "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." (PRC 21084.1; CEQA Sec. 15064.5(b)). Pursuant to PRC Section 21083.2, "the lead agency shall determine whether the project may have a significant effect on archaeological resources."

CEQA uses the term "historical resources" to include buildings, sites, structures, objects, or districts that may have historical, pre-historical, architectural, archaeological, cultural, or scientific importance. A resource is considered historically significant under three (3) circumstances: (1) if it is CRHR-listed or determined to be eligible for such listing by the State Historical Resources Commission; (2) if it is included in a local register of historical resources (unless the preponderance of evidence demonstrates that it is not historically or culturally significant); or (3) if it meets at least one of the criteria for listing on the CRHR (CEQA Sec. 15064.5(a)). Properties that are listed in or eligible for listing in the National Register of Historic Places ("NRHP") are considered eligible for listing in the CRHR and therefore significant historical resources for the purpose of CEQA (PRC Sec. 5024.1(d)(1)). CEQA further identifies that the fact that a resource is not listed in, or determine to be eligible for listing in the California Register of Historic Resources (or local register) or identified in an historical resource survey does not preclude a lead agency from determining that the resource may be a historical resource as defined pursuant to Public Resource Code 5020.1(j) or 5024.1 (CEQA Guidelines Sec. 15064.5(a)(4).

For the purposes of CEQA, a project that may cause a substantial adverse change in the significance of a historical resource would represent a potentially significant effect on the environment (CEQA Guidelines Sec. 15064.5(b)). A substantial adverse change in the significance of a historic resource is defined as the "physical demolition, destruction, relocation, or alteration of the resources or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines Sec. 15064.5(b)(1)). CEQA further identifies that the significance of a historic resource is materially impaired when a project:

1. demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its inclusion in (or eligibility for) inclusion in the CRHR (CEQA Guidelines Sec. 15064.5(b)(2)(A)); or
2. demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that account for its inclusion in a logical register of historic resources (CEQA Guidelines Sec. 15064.5(b)(2)(B)); or

3. demolishes or materially alters in an adverse manner those physical characteristics of a historic resource that convey its historical significance and justify its eligibility for inclusion in the CRHR as determined by the lead agency (CEQA Guidelines Sec. 15064.5(b)(2)(C)).

CEQA also provides further guidance regarding the treatment (and evaluation of impacts) of cultural and historic resources. Specifically, CEQA Guidelines Sec. 15064.5(b)(3) identifies that "a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Property with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on the historical resource." CEQA also requires the lead agency to identify feasible measures to mitigate significant adverse changes in the significance of a historical resource (CEQA Guidelines Sec. 15064.5(b)(4)). CEQA further requires that if a project would affect a state-owned historical resource, and the lead agency is a state agency, the lead agency shall consult with the State Historic Preservation Officer as provided in PRC Sec. 5024.5 (see below for more information concerning PRC Sec. 5024.5)(CEQA Guidelines Sec. 15064.5(b)(5)).

When a project would impact an archaeological site, the lead agency must determine whether the site represents a historical resource as defined in CEQA Guidelines Sec. 15064.5(c)(1). If it the site qualifies as a historical resource, then it is entitled to protection under CEQA. If the site does not meet the requirements of a historical resource, the agency must determine whether the site is a "unique archaeological resource." According to PRC Sec. 21083.2(g) a "unique archaeological resource" consists of "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 example available of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person."

If a site qualifies as a "unique archaeological resource," it is protected under CEQA. If the agency determines the site does not qualify, then the site merits no further consideration. If an archaeological resource does not meet either the historical resource or the more specific "unique archaeological resource" definition, impacts do not need to be mitigated (CEQA Guidelines Sec. 15064.5 (c)(4)). Where the significance of a site is unknown, it is presumed to be significant for the purpose of the EIR investigation.

As described above, historical resources are "significantly" affected if there is demolition, destruction, relocation, or alteration of the resource or its surroundings. Public agencies, wherever feasible, should seek to avoid impacting historical resources of an archaeological nature (CEQA Guidelines Sec. 15126.4(b)(3)). Moreover, preservation in place is the preferred form of mitigation for a "historical resource of an archaeological nature" since it maintains the relationship between artifact and context, and may avoid conflicts with groups associated with the site (CEQA Guidelines Sec. 15126.4 (b)(3)(A)). CEQA identifies that preservation in place can be accomplished in a variety of manners, including, but not limited to the following:

1. Planning construction to avoid archaeological sites;

2. Incorporation of sites within parks, greenspace, or other open space;
3. Covering (or "capping") the archaeological site with a layer of chemically stable soil before building facilities on the site; or
4. Deeding the site into a permanent conservation easement. (CEQA Guidelines Sec. 15126.4 (b)(3)(B))

In the event that data recovery through excavation is the only feasible mitigation, a data recovery plan shall be prepared and adopted prior to excavation (CEQA Guidelines Sec. 15126.4(b)(C)). The time and cost limitations that may apply to the excavation of archaeological resources do not apply to activities that determine whether the archaeological resources are "unique" (CEQA Guidelines Sec.15064.5 (c)(3)).

In addition, CEQA Guidelines Sec. 15064.5(f) also includes procedures for the accidental discovery of historical or unique archaeological resources during construction. Applicable requirements include an immediate evaluation of the undiscovered resource by a qualified archaeologist. If the resource is determined to be a historical or unique archaeological resource, avoidance measures or appropriate mitigation measures should be implemented. Work in the immediate area of the find should be halted, but work can continue on other parts of the site while the appropriate resource mitigation is implemented. CEQA Guideline Sec. 15064.5(e) states that in the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, then the steps that are described in the CEQA Guidelines Sec. 15064.5(e)(1) and 15064.5(e)(2) must be followed.

4.4.3.2 Local

Monterey County 1982 General Plan. The County of Monterey General Plan provides policies for the protection of cultural resources. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing,** for a detailed analysis of the Project's consistency with the County's cultural and tribal resource policies Relevant policies are listed below:

12.1.3 All proposed development, including land divisions, within high sensitivity zones shall require an archaeological field inspection prior to project approval.

12.1.4 All major projects (i.e., 2.5 acres or more) that are proposed for moderate sensitivity zones, including land divisions, shall require an archaeological field inspection prior to project approval.

12.1.5 Projects proposed for low sensitivity zones shall not be required to have an archaeological survey taken unless specific additional information has been obtained to suggest that archaeological resources are present.

12.1.6 Where development could adversely affect archaeological resources, reasonable mitigation procedures shall be required prior to project approval.

12.1.7 All available measures, including purchase of archaeological easements, dedication to the County, tax relief, purchase of development rights, consideration of reasonable project alternatives, etc., shall be explored to avoid development on sensitive archaeological sites.

52.1.2 The County shall encourage and assist property owners to submit applications to qualify appropriate properties and buildings on the National Register of Historic Places and/or the State Landmark program. Those achieving such status shall be given "HR" zoning.

52.1.3 The County shall work with property owners to mitigate the destruction or alteration of historic resources by zoning identified historic sites as "HR" or Historic Resources zones. The "HR" reclassification would be implemented as follows:

- Either at the time of requests for demolition or alteration of the resource, or
- At the time of mutual agreement between the County and the property owner to preserve that historic resource.

52.1.4 The County shall appoint an Architectural Review Board to review restoration, rehabilitation, alteration and demolition proposals of those cultural resources identified by the cultural resources inventory.

52.1.5 The County shall support any such tax incentive, mutual covenants, protective covenants, purchase options, preservation easements, building, fire, health and County code modifications and any other methods deemed mutually agreeable between County and landowner which will help to preserve historic resources.

52.1.6 The County shall, through monies acquired from grants, donations and other revenue sources, provide funds for the restoration and enhancement of historic resources.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The NCAP provides policies for the protection of cultural resources. Please refer to **Table 4.10-5** in **Section 4.10, Land Use, Population, and Housing,** for a detailed analysis of the Project's consistency with applicable cultural resources policies. Relevant policies are listed below:

12.1.8 (NC) The North County Archaeological Sensitivity Map shall be used in interpreting General Plan policies which address the requirements for field inspections in moderate and high archaeological sensitivity zones; this map shall be updated as dictated by new research and information.

4.4.4 IMPACTS AND MITIGATION MEASURES

4.4.4.1 Thresholds of Significance

A project impact would be considered significant if the project would:

a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5;

b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5;

c. Disturb any human remains, including those interred outside of formal cemeteries; or,

d. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resource 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:

    1. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historic resources as defined in Public Resources Code section 5020.1(k); or,

    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 Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of the Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

4.4.4.2 Impact Analysis

Impact CR-1: The Proposed Project would result in the demolition of existing on-site residences and other existing on-site improvements to accommodate development of the site. The Proposed Project would not, however, cause a substantial adverse change in significance of a historic resource as defined in §15064.5. This represents a less than significant impact. No mitigation measures are warranted. (Criterion a).

CEQA Guidelines §15064.5 describes a historical resources as: 1) any resource that is listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources; 2) a resource included in a local register of historical resources; and, 3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant based on substantial evidence in light of the whole record. The fact that a resource is not listed in, or determined to be eligible for listing does not preclude a lead agency from determining that the resource may be a historical resource (CEQA Guidelines §15064.5(4)). A historical resource may be eligible for inclusion in the CRHR if it:

1. Associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage (Criterion 1);

2. Associated with the lives of persons important in our past (Criterion 2);

3. 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 (Criterion 3); or

4. Has yielded, or may be likely to yield, information important in prehistory or history (Criterion 4).

A substantial change includes the physical demolition, destruction, relocation, or alteration of a resource or its immediate surroundings such that the significance would be materially impaired (CEQA Guidelines §15064.5(b)).

The Proposed Project would result in a potentially significant impact if it would result in the physical demolition, destruction, relocation, or alternative of a historic resource (CEQA Guidelines Sec. 15064.5(b)(1)). A resource is considered historically significant under three (3) circumstances: (1) if it is CRHR-listed or determined to be eligible for such listing by the State Historical Resources Commission; (2) if it is included in a local register of historical resources (unless the preponderance of evidence demonstrates that it is not historically or culturally significant); or (3) if it meets at least one of the criteria for listing on the CRHR (CEQA Sec. 15064.5(a)).

The Proposed Project site does not contain any known state or local historical resources. The Project site is predominantly vacant except for three (3) existing residences and support structures (see **Figure 4.1-2c**). These structures would be demolished to accommodate future residential development on the site. The existing structures do not meet the criteria for historic significance and, therefore, are not considered to be potentially historic. The criteria for designation includes the following:

1. Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
2. Associated with the lives of persons important to local, California or national history.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of a master or possesses high artistic value.
4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

The existing structures are contemporary and made with materials that date 20-30 years. They are not associated with a significant event or person that contribute to local or regional history. Many of the existing structures (residences included) are modular and dilapidated and do not embody a distinctive type, period, region, or method of construction or represent the work of a master or possess high artistic value. As a result, the Proposed Project would not cause a substantial adverse change in the significance of a historical resource. The Project would not affect a historical resource as defined by §15064.5. **This represents a less than significant impact. No mitigation measures are necessary.**

Significance: Less than Significant.

Mitigation: None.

Impact CR-2: Construction of the Project may result in the discovery and disturbance of unknown archaeological resources, and/or tribal cultural resources. This represents a potentially significant impact that could be reduced to a less than significant level with implementation of recommended mitigation measures. (Criterion b).

Public Resources Code §21083.2 requires that lead agencies evaluate potential impacts to archaeological resources. Specifically, lead agencies must determine whether a Project may have a significant effect or cause a substantial adverse change in the significance of a unique archaeological resource. As discussed above, a unique archaeological resource is defined as "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 example available of its type; and, 3) is directly associated with a scientifically recognized important prehistoric or historic event or person." If a site qualifies as a "unique archaeological resource," it is protected under CEQA.

As noted above, the Project site is in an area of low archaeological sensitivity (Monterey County, 1982). No archaeological resources are known to occur on-site. According to the *Preliminary Archaeological Reconnaissance*, the Project site does not contain surface evidence of archaeological resources. Although Archaeological Consulting, Inc. identified two (2) prehistoric archaeological sites within one (1) kilometer of the Project site; the Project site did not contain any of the materials associated with prehistoric cultural resources (e.g., dark midden soil, marine shell fragments, bones, or bone fragments, broken or fire-altered rocks, flaked or ground stone, etc.). The Proposed Project would not affect those resources located off-site.

Although the Project would not directly affect a known archaeological resource or tribal cultural resource, construction activities have the potential, albeit remote, to unearth buried or previously unknown archaeological resources. As a result, mitigation is necessary to ensure that indirect effects to a previously unknown or buried resource are minimized to a less than significant level. **This is considered a potentially significant impact that could be mitigated to a less than significant level through the implementation of the following mitigation measures identified below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure CR-2a:

Prior to the issuance of any grading or building permits, the Applicant shall submit evidence (i.e., a contract) demonstrating that the Applicant has retained a qualified archaeologist to monitor ground disturbing activities. To minimize potential impacts to previously unknown or subsurface historical or archaeological resources, a qualified archaeologist shall monitor all major ground-disturbing activities associated with the construction of subdivision improvements and grading of proposed building envelopes. All work shall stop if a cultural resource is discovered during construction. If archaeological resources or human remains are discovered during any construction, work shall be halted within 50 meters (±160 feet) of the find until it can be evaluated by a qualified professional archaeologist. If the find is determined to be significant, appropriate mitigation measures shall be formulated and implemented, with the concurrence of the Lead Agency. The County Coroner shall be notified in accordance with provisions of Public Resources Code 5097.98-99 in the event human remains are found and the Native American Heritage Commission shall be notified in accordance with the provisions of Public Resources Code section 5097 if the remains are determined to be of Native American origin. The Applicant shall submit a signed contract with the qualified professional archaeologist incorporating the requirement of this mitigation to the HCD – Planning Services for review and approval. The applicant shall also submit on-going monitoring reports from the archaeologist to HCD – Planning Services in accordance with the contract requirements.

Impact CR-3: The Proposed Project could potentially affect human remains, including those interred outside of formal cemeteries. This represents a potentially significant impact that could be reduced to a less than significant level through the implementation of mitigation. (Criterion c).

The Proposed Project could potentially have an adverse effect on human remains, including those interred outside formal cemeteries. Archaeological Consulting conducted a *Preliminary Archaeological Reconnaissance* in April, 2007. Site records, maps, and project files of the Northwest Regional Information Center of the California Historical Resource Information System, in addition to Archaeological Consulting's own files and maps were used to evaluate the Project site for cultural, historical, archaeological resources. Archaeological Consulting concluded that no known human remains, including those interred outside of formal cemeteries, are known to occur within the Project site. In addition, the Project site is not a Sacred Lands site and the presence of known Native American remains was not identified during the Preliminary Archaeological Reconnaissance. Tribal notification letters were sent August 8, 2024 to the following: OCEN, Esselen Tribe of Monterey County, and KaKoon Ta Ruk Band of Ohlone-Costanoan Indians. The County of Monterey HCD - Planning had not received responses at the time the EIR was prepared. Although unlikely, human remains may be encountered during construction activities. The implementation of **Mitigation Measure CR-2a** described above, which includes requirements relating to temporarily halting ground-disturbing activities in the event that human remains are uncovered, would ensure that potential impacts would be less than significant level**. This represents a potentially significant impact that could be reduced to a less than significant level through the implementation of mitigation. No additional mitigation measures are warranted.**

Significance: Less than Significant with Mitigation.

Mitigation: Measure **CR-2a** (see above).

Impact CR-4: The Proposed Project would result in ground disturbing activities. As a result, the Proposed Project could potentially affect a tribal cultural resource, defined in Public Resource Code section 21074 and that is listed or eligible for listing in the California Register of Historical Resources, or a local register of historical resources defined in Public Resources Code section 5020.1(k) and 5024.1(c). This represents a potentially significant impact that could be reduced to a less than significant level through the implementation of mitigation. (Criterion d).

The Proposed Project could result in a substantial adverse change in the significance of a tribal cultural resource, as defined in Public Resource Code section 21074, that is listed or eligible for listing in the California Register of Historic Resources, or in a local register of historic resources. Public Resources Code section 21074 defines a tribal cultural resource as "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, [or] b) included in a local register of historical resources as defined in subdivision (k) of [Public Resources Code] Section 5020.1" (Public Resources Code Section 21027(a)).

The Proposed Project site is not listed in the California Register of Historic Resources nor is the site included in a local register of historical resources as defined in Public Resources Code Section 5020.1(k). Similarly, the Proposed Project site is not listed as eligible, nor has the site previously been identified as eligible for listing on

the California Register of Historic Resources. Additionally, as discussed above, the Project site is not a Sacred Lands site, nor were Native American or historic-period archaeological resources identified in the 2006 NWIC search. Similarly, Archaeological Consulting did not identify any archaeological resources as part of their 2007 assessment.[1] Although the Project would not directly affect tribal cultural resource, construction activities have the potential, albeit remote, to unearth buried or previously unknown resources. **This is considered a potentially significant impact that can be mitigated to a less than significant level through the implementation of the mitigation measures identified above. No further mitigation is warranted.**

Significance: Less than Significant with Mitigation.

Mitigation: Measure CR-2a (see above).

4.4.5 REFERENCES

Archaeological Consulting. 2007. *Preliminary Archaeological Reconnaissance for the LaTourette Subdivision, Salinas, Monterey County, California.* Dated January 2007.

Assembly Bill 52, Gatto. 2014. An act to amend Section 5097.94 of, and to add Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3 to, the Public Resources Code, relating to Native Americans. Dated September 2014.

County of Monterey. 2006. *Monterey County 2006 General Plan Draft Program Environmental Impact Report.*

_____. 1985. *North County Area Plan and Amendments.* Adopted July 1985.

_____. 1982. *Monterey County General Plan and Amendments.* Adopted September 1982.

[1] AB 52 requires notification and the opportunity for consultation by local Native American representatives with ties to the area affected by a project. AB 52 also amends CEQA to require evaluation of impacts to "tribal cultural resources." The term tribal cultural resources is defined to include sites that are important to a California Native American Tribe. Section 11(c) of AB 52 states that the act is applicable only to projects that have a notice of preparation, or a notice of negative declaration filed, or mitigated native declaration on or after July 1, 2015. The NOP for the Proposed Project was filed with the State Clearinghouse on July 20, 2004, therefore consultation is not required under AB 52.

4.5 ENERGY

4.5.1 INTRODUCTION

This section describes the energy setting for the Project and evaluates the Project's potential energy impacts during the construction and operation. The following section 1) describes the environmental setting, 2) identifies the regulatory environment, and 3) evaluates the Proposed Project's potential adverse environmental effects and identifies the mitigation measures to reduce those effects, as necessary. **Table 4.5-1** summarizes the anticipated environmental effects of the Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.5.5, Impacts and Mitigation Measures**.

Table 4.5-1
Summary of Energy Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measure	Residual Impact
Energy-1	The Proposed Project would result in a temporary increase in energy demand in connection with construction-related activities. In addition, the Proposed Project would also permanently increase on-site energy usage in connection with the future residential use of the site. While the Proposed Project would increase energy consumption, this would not result in the wasteful, inefficient, or unnecessary consumption of energy.	Less than Significant	None	Less than Significant
Energy-2	The Proposed Project would not conflict or obstruct a state or local plan for renewable energy or energy efficiency.	Less than Significant	None	Less than Significant

4.5.2 ENVIRONMENTAL SETTING

4.5.2.1 Existing Setting

Electricity. Electric energy used in Monterey County is procured from carbon-free and renewable energy sources (i.e., solar, wind, and hydro). Pacific Gas & Electric ("PG&E") operates a grid distribution system that transmits electricity with a network of transmission and distribution lines throughout the service area to approximately 140,000 residential and nonresidential user accounts. Central Coast Community Energy ("3CE") distributes electricity throughout Monterey County. In 2019, Monterey County consumed 2,499.53 millions of kilo-watt Hours (CEC, 2020).

Natural Gas. PG&E's natural gas is delivered through high-pressure pipelines to its load centers with compressors used to maintain transmission pressure. Smaller distribution pipelines distribute gas to facilities (commercial, residential) or other underground storage facilities. In 2020, Monterey County consumed 114 millions of therms of natural gas (CEC, 2020).

4.5.3 REGULATORY ENVIRONMENT

4.5.3.1 State

California Renewable Energy Standards. California established its Renewable Portfolio Standard ("RPS") Program in 2002. The RPS Program established the goal of increasing the percentage of renewable energy in the State's electricity mix to 20-percent of retail sales by 2010. In 2006, this goal was codified under Senate Bill ("SB") 107 which required investor-owned utilities to generate 20-percent of their retail electricity using qualified renewable energy technologies by the end of 2010. Executive Order S-14-08 was signed into law in 2008 and required retail sellers of electricity to serve 33-percent of their load with renewable energy by 2020.

California Building Codes. Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations ("Title 24") was established in 1978 to respond to California's energy consumption. Title 24 is updated every three (3) years and requires compliance at the time new building permits are issued by city and county governments. To support energy conservation, the California Green Building Standards Code ("CalGreen"), Title 24, Part 11, establishes mandatory green building standards for all buildings in California. CalGreen covers five (5) categories; planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality.

4.5.3.2 Local

Monterey County 1982 General Plan. The County of Monterey General Plan provides policies to promote energy efficiency and encourage the development of renewable energy resources. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing,** for a detailed analysis of the project's consistency with the County's energy related policies. Relevant policies are listed below:

13.2.1 Intensive development shall be encouraged toward existing urban areas where energy expended for transportation and provisions of services can be minimized.

13.3.1 Lots shall be oriented so structures may maximize the energy gains from solar sources and minimize energy losses where possible.

13.3.2 Cluster development, at the same density, shall be favored over more scattered development on a given parcel of land, if such developed can be shown to conserve energy.

13.3.3 Plans for major projects shall address opportunities for reducing energy used for transportation, including pedestrian and bicycle pathways, access to transit, and roadway design.

13.4.1 Cost-effective weatherization of exiting building shall be encouraged by the County.

13.4.2 All new residential dwellings shall be required to meet or exceed the building efficiency standards established by the State of California.

13.4.3 Building designs which reduce demands for artificial heating, cooling, ventilation, and lighting shall be encouraged.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The NCAP does not include any energy policies that are applicable to the Proposed Project.

4.5.4 IMPACTS AND MITIGATION MEASURES

4.5.4.1 Thresholds of Significance

A project impact would be considered significant if the project would:

a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.5.4.2 Impact Analysis

Impact Energy-1: **The Proposed Project would result in a temporary increase in energy demand in connection with construction-related activities. In addition, the Proposed Project would also permanently increase on-site energy usage in connection with the future residential use of the site. While the Proposed Project would increase energy consumption, this would not result in the wasteful, inefficient, or unnecessary consumption of energy. This represents a less than significant impact. No mitigation measures are warranted. (Criterion a).**

The Proposed Project would increase on-site energy consumption as compared to existing, pre-project, conditions. Specifically, the Proposed Project would temporarily increase on-site energy demand in connection with construction-related activities, as well as operational energy demand associated with future residential use. The following includes an evaluation of the Proposed Project's construction and operational impacts.

Construction

Project construction would result in energy usage during the construction of on-site infrastructure and future residences. Energy consumption would occur in connection with the procurement and transportation of materials to the site, preparation of the Project site (e.g., grading, materials hauling, etc.), operation of construction equipment, and construction of site improvements, including infrastructure and future residences. Petroleum-based fuels such as diesel fuel and gasoline would be the primary sources of energy for these activities. While the construction energy use has not been quantified, the Project would not result in the inefficient, wasteful, or unnecessary consumption of energy because 1) the construction schedule and process is designed to be efficient to avoid excess monetary costs, and 2) energy use required to complete construction would occur over approximately one (1) year. Additionally, as discussed below (see **Impact Energy-2**) the operation of construction equipment is regulated by CARB to reduce emissions from in-use, off-road, heavy-duty diesel vehicles in California by imposing limits on idling, requiring all vehicles to be reported to CARB, restricting the addition of older vehicles into fleets, and requiring fleets to reduce emissions by retiring, replacing, or repowering older engines, or installing exhaust retrofits, subsequently improving fuel efficiency

and reducing GHG emissions. For these reasons, construction of the Proposed Project would not result in the wasteful, inefficient, or unnecessary consumption of energy.

Operation

The Proposed Project would generate operational energy demand associated with vehicular traffic and on-going residential use of the Project site. The increase in operational energy associated with the Proposed Project would not, however, constitute the wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources. As identified elsewhere in this EIR, the Proposed Project site is currently improved with three existing residences (mobile homes), which would be demolished as part of the Proposed Project. The Proposed Project would represent a net increase of 16 residences on site. At buildout, the Proposed Project would require permanent connections for electricity and natural gas services to power internal and external building lighting, heating and cooling systems, water heating, and ventilation systems.

The Proposed Project would not significantly increase energy demand, nor would the energy required by vehicular trips generated by Proposed Project significantly increase energy demand. As discussed in **Section 4.7, Greenhouse Gases**, AMBIENT Air Quality & Noise Consulting ("Ambient") prepared an air quality and greenhouse gas analysis for the Proposed Project. As part of that analysis, Ambient identified anticipated future energy use to evaluate potential air quality effects associated with the Proposed Project. Ambient identified that Proposed Project would generate an estimated 117,038 KWh of electricity and 552,237 kBTU of natural gas usage annually. The Proposed Project would be required to implement energy conservation measures consistent with current California Building Code and Green Building Standards requirements (e.g., solar photovoltaic) The implementation of these measures as part of project design ensures that potential energy demand associated with the Proposed Project would be minimized. For these reasons, operation of the Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy.

Conclusion

Based on the discussion above, the Proposed Project would not result in a potentially significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources during Project construction or operation. Construction would result in a temporary increase in energy consumption, but this would not constitute the wasteful, inefficient, or unnecessary consumption of energy. In addition, the Proposed Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources during project operation. The Proposed Project would be required to comply with current California Building Code requirements in effect at the time of building permit issuance which would ensure that operation of the Proposed Project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources. **Therefore, the Proposed Project would have a less than significant impact. No mitigation measures are warranted.**

Significance: Less than Significant.

Mitigation: None.

Impact Energy-2: **The Proposed Project would not conflict or obstruct a state or local plan for renewable energy or energy efficiency. This represents a less than significant impact. No mitigation measures are warranted. (Criterion b).**

See the response above. The construction and operation of the Proposed Project would have a less than significant impact related to energy usage and efficiency. CARB recently prepared the 2017 Climate Change Scoping Plan Update which builds upon the previous efforts to reduce GHG emissions and is designed to continue to shift the California economy away from dependence on fossil fuels. Appendix B of the 2017 Scoping Plan includes examples of local actions (municipal code changes, zoning changes, policy directions, and mitigation measures) that would support the State's climate goals. The examples provided include, but are not limited to, enforcing idling time restrictions for construction vehicles, utilizing existing grid power for electric energy rather than operating temporary gasoline/diesel-powered generators, and increase use of electric and renewable fuel-powered construction equipment. CARB developed such measures to address greenhouse gas emissions, however, they also directly (and indirectly) effect energy consumption by encouraging renewable energy and other clean energy options. Furthermore, even during the more intensive periods of construction, where construction activities would occur at the same time, activities that would demand energy, and therefore create emissions, would be dispersed across the Project site.

The Project would comply with existing state energy standards and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. More specifically, the Proposed Project would be subject to the most recent energy conservation requirements of Title 24 of the California Code of Regulations, known as the California Building Standards. Measures to conserve energy may include energy-efficient windows and exterior doors, efficient heating and cooling systems, water heating systems, efficient lighting, and Energy-Star approved appliances. Additional Title 24 requirements would include roofing insulation, solar reflectance roofing materials, and lighting controls. In addition, electricity supplied to the Project site by PG&E would comply with the State Renewable Portfolio Standard, which requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement by 2020 and to 60-percent by 2030. Thus, a portion of the energy consumed during project operations would originate from renewable sources. **Therefore, the Proposed Project would not conflict or obstruct state or local plan for renewable energy or energy efficiency, this is a less than significant impact. No mitigation measures are warranted.**

Significance: Less than Significant.

Mitigation: None.

4.5.5 REFERENCES

Ambient Air Quality & Noise Consulting. 2018. *Air Quality & Greenhouse Gas Impact Assessment for La Tourette Subdivision Project*. Dated June 2018.

California Energy Commission. 2020. *Electricity Consumption by County*. Available at: https://ecdms.energy.ca.gov/elecbycounty.aspx.

Monterey County. 1985. *North County Area Plan and Amendments*. Adopted July 1985.

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U.S. Environmental Protection Agency. *Greenhouse Gases Equivalencies Calculator*. Available at: Greenhouse Gases Equivalencies Calculator - Calculations and References | US EPA.

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4.6 GEOLOGY AND SOILS

4.6.1 INTRODUCTION

This section describes the geologic and seismic setting for the Proposed Project and evaluates its potential to cause geologic impacts, such as erosion during construction, or to be subjected to geologic hazards, such as earthquakes. The following section: 1) describes the environmental setting, 2) identifies the regulatory environment, and 3) evaluates the Proposed Project's potential adverse environmental effects and identifies mitigation measures to reduce those effects, where necessary. This section is partially based on the results of the *Preliminary Geologic and Geotechnical Report for La Tourette, A Residential Subdivision* prepared by Haro, Kasunich and Associates, Inc. ("HKA") (September 2004).

Table 4.6-1 summarizes the Proposed Project's potential environmental effects, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.6.5, Impacts and Mitigation Measures**.

Table 4.6-1
Summary of Geology & Soils Environmental Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measures	Residual Impacts
GS-1	Seismic ground shaking at the Project site may occur during the next major earthquake on a regional fault system. Such shaking can cause severe damage to or collapse of building or other Project facilities and may expose people to injury or death. The Project site is in a seismically active region and could expose people and structures to potential adverse effects.	Potentially significant	GS-1	Less than significant
GS-2	Construction of the Project could result in substantial soil erosion or loss of topsoil. Extensive grading on the site to facilitate the Project-related infrastructure could result in substantial erosion or loss of topsoil.	Potentially significant	GS-2a GS-2b	Less than significant
GS-3	The Proposed Project could result in potential geologic hazards due to soils that are unstable or could become unstable as a result of landslides, lateral spreading, expansive soils, liquefaction, and localized subsidence. While the Proposed Project would likely not result in on-or-off site landslides or induce lateral spreading, there is risk of subsidence, liquefication, and collapse in isolated areas.	Potentially significant	GS-1 GS-2a GS-2b GS-3	Less than significant

4.6.2 ENVIRONMENTAL SETTING

4.6.2.1 Regional Setting

Geologic structure in central California is primarily the result of tectonic events that have occurred during the past 30 million years. It is believed that the numerous faults in this area are due to movements along the boundary between the Pacific and North American tectonic plates. The relative motion between these two (2)

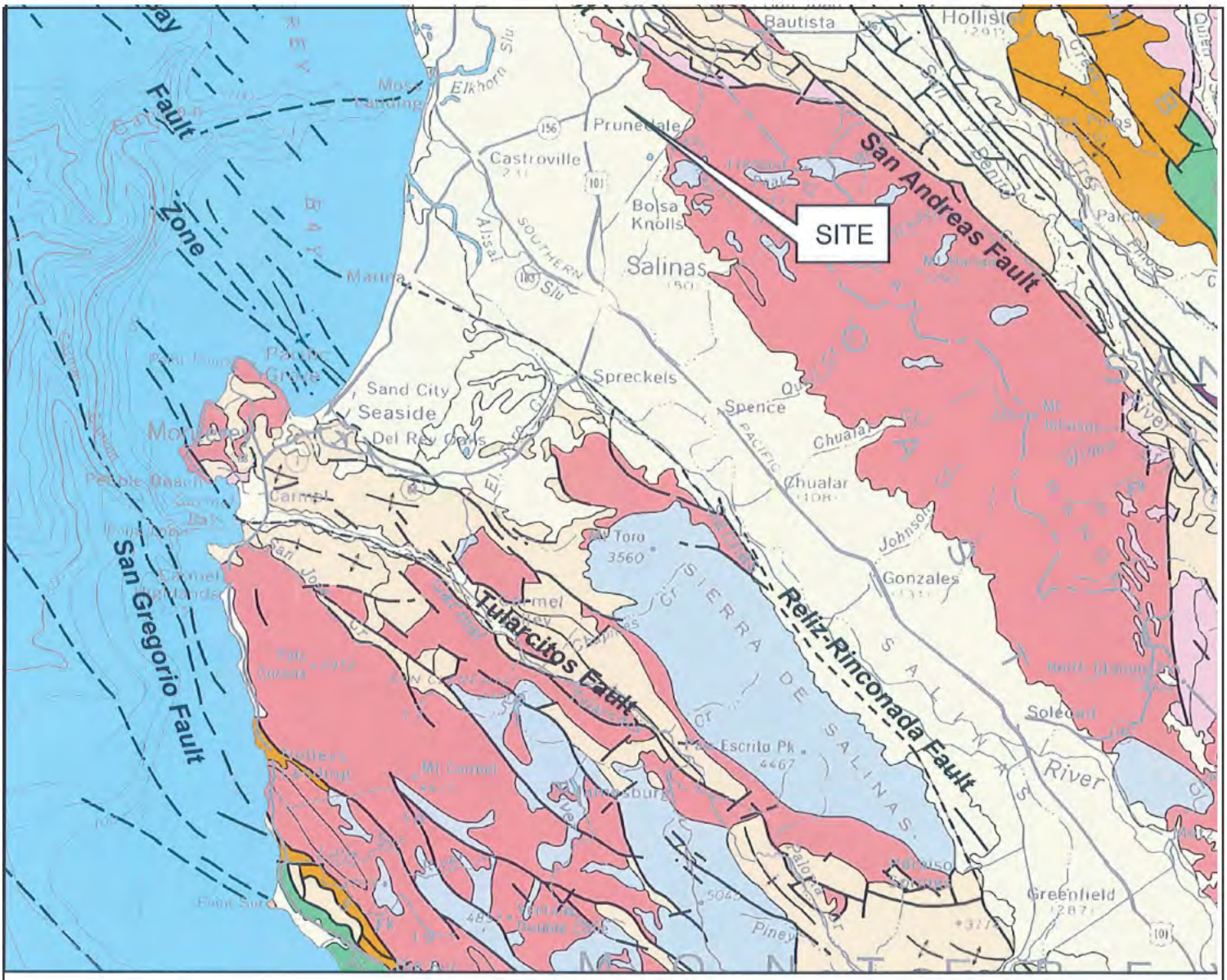
tectonic plates is taken up largely along the northwest-trending San Andreas Fault system, which defines the regional boundary between the two (2) plates. The Project site is on the southeastern fringe of the Watsonville lowlands near the western flank of the Gabilan Range in the central portion of the Coast Ranges physiographic province of California (HKA, 2004). This portion of the Coast Range is characterized by a series of rugged, linear ridges and valleys following the pronounced northwest to southeast structural grain of central California geology. The Gabilan Range is predominantly underlain by a large, elongated prism of granitic and metamorphic basement rocks, collectively known as the Salinian Block. These rocks are separated from contrasting basement rock types to the northeast and southwest by the San Andreas and San Gregorio-Nacimiento strike-slip fault systems, respectively. Overlying the granitic basement rocks is a sequence of marine sedimentary rocks of the Paleocene to Pliocene age and non-marine sediments of Pliocene to Pleistocene age. The Quaternary history of the Watsonville lowlands has been dominated by fluvial, marine, and eolian deposition because the central Monterey Bay region has been relatively stable, though northern and southern Monterey Bay regions have been tectonically uplifted. The earth materials in the project vicinity are mostly fluvial and alluvial fan sediments graded to one or more Sangamon highstands of sea level (HKA, 2004).

4.6.2.2 Seismic Setting

The Project site is in a seismically active region and several potentially active faults are located within proximity of the site. Throughout the Cenozoic Era, this region of California has been dominated by tectonic forces associated with lateral or "transform" motion between the North American and Pacific lithospheric plates. These movements produce long, northwest-trending faults, such as the San Andreas and San Gregorio faults, with horizontal displacements measured in tens to hundreds of miles. Accompanying the northwest direction of the horizontal movement of the plates have been episodes of compressive stress, repeated episodes of uplift, deformation, erosion, and subsequent re-deposition of sedimentary rocks. Along the coast, the ongoing tectonic activity is most evident in the formation of a series of uplifted marine and fluvial terraces. Refer to **Figure 4.6-1** for the Regional Geologic Map.

According to the California Geological Service, the site is not located within an Alquist-Priolo Earthquake zone. The closest active faults that may present a seismic hazard to the Proposed Project, include the San Andreas and Zayante faults. These faults are either active or considered potentially active.

San Andreas Fault. The San Andreas Fault is approximately 5.28 miles northeast of the Project site (HKA, 2004) and is the most prominent fault and seismic hazard. The San Andreas Fault is a right-lateral strike-slip fault that generally delineates the transform plate boundary between the North American and Pacific Plates. Trending to the northwest southeast, this fault is nearly vertical as evident by straight outcrop patterns across topography of noticeable relief. Historically, the largest earthquake along the San Andreas Fault was the 1906 San Francisco earthquake with an estimated magnitude of 8.3. The San Andreas was also the source of strong earthquakes in 1865 and 1989 (estimated magnitude of 7 and 7.1, respectively). HKA identified two (2) segments of the San Andreas Fault that have the potential of generating earthquakes with magnitudes of 6 – 7.9 every 200 years and every 138 years (independent segment recurrence) or every 400 years (multi-segment recurrence interval), respectively (HKA, 2004).



Reference: Jennings, C.W., 1977, Geologic Map of California: California Department of Conservation, Division of Mines and Geology, scale 1:750,000.
Digital Data: Saucedo, G.J., Bedford, D.R., Raines, G.L., Miller, R.J., and Wentworth, C.M., 2000, GIS Data for the Geologic Map of California: California Department of Conservation, Division of Mines and Geology, CD-ROM 2000-007, ver. 2.0.

Legend

Geologic Units

- Quaternary Deposits
- Quaternary Volcanics
- Tertiary Sedimentary Rocks
- Tertiary Volcanic Rocks
- Pre-Tertiary Sedimentary Rocks
- Pre-Tertiary Volcanic Rocks
- Grantic Intrusive Rocks
- Franciscan Complex
- Ultramafic Rocks
- Pre-Tertiary Metamorphic Rock
- Pre-Cambrian Metamorphic and Igneous Rocks

Symbols

- contact
- fault, certain
- fault,approx. located
- fault, concealed or inferred
- anticline
- monocline
- syncline

N

SCALE 1:500,000

5 0 5 10 Miles

Source: Nolan, Zinn and Associates, 2004

Regional Geologic Map	Date 12/16/2021	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 4.6-1
	Scale N/A		

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Zayante (-Vergeles) Fault. The Zayante fault is approximately 1.67 miles northeast of the Project site (HKA, 2004). This fault lies west of the San Andreas fault and trends about 50 miles northwest from the Watsonville lowlands into the Santa Cruz Mountains. Historically, this fault has moved vertically. Based on other geological evidence, this fault is considered to be active and has the potential to generate a magnitude 6.8 earthquake. HKA found that while considered potentially active and capable of generating a 6.8 magnitude earthquake, such an event would have a recurrence interval of 10,000 years.

4.6.2.3 Local Geologic Setting

The Proposed Project is within the vicinity of the southeastern fringe of the Watsonville lowlands (HKA, 2004). This area is a nominally subsiding basin dominated by river depositions in conjunction with fluctuating sea levels caused by cycles of continental glaciation for about the last one million years. This interplay has given rise to a series of river deposits interlayered with and overlain by sand dune and marine terrace deposits. The Project site is underlain by the mid-Quaternary age Aromas Sand, a sequence of fluvial and dune sediments, and is considered a heterogeneous sequence of relatively well consolidated eolian and fluvial sand, silt, clay, and gravel (ibid.).

The Proposed Project site is underlain by the eolian deposit subdivision of the Aromas Formation with surficial deposits derived from the Aromas Formation called Colluvium filing the two south-trending drainage swales (ibid). The eolian deposits consist of fine to medium-grained, well-sorted sand containing varying amounts of silt and clay. HKA encountered clay-rich horizons were at various depths across the property. The total thickness of the eolian deposits in the vicinity of the property appears to be in excess of several hundred feet, based upon the HKA inspection of the geological characterization produced by Dupre and Tinsley (1980). Additionally, the Colluvium filling, located in the two (2) south-trending drainage swales, consists of very loose to loose, well-sorted fine to medium grain sand containing varying amounts of silt. The composition of the Colluvium is similar to the eolian deposits because it is derived from them. The total thickness of the Colluvium in the swales is at least 20 feet and possibly deeper, based upon the results from the boring. HKA did not observe any landslide deposits or scaring on the Project site. Moreover, no landslide deposits or scaring have been mapped on the Project site.

In addition to geological characterization noted above, HKA also identified artificial fill associated with road grading and potentially farming operations at various locations on the property. HKA also noted that it appears that the soil across some portions of the property have been ripped and disturbed as part some former clearing operations. HKA did not perform a detailed analysis of the condition of the fill. Additionally, HKA observed grading associated with the various roads, but reported no evidence of large-scale grading on the property during the geotechnical investigation (ibid.).

4.6.2.4 Soils

The Soil Survey of Monterey County, California, classifies the site soils as consisting of soils typical of the Arnold series (USGS, 1978). Generally, these soils consist of excessively drained soils that formed on hills and uplands in old marine sand dunes. The surface layer is typically dark brown, slightly acid loamy sand about eight (8) inches thick, and the subsoil is mixed brown and strong brown, slightly acid loamy fine sand underlain by soft sandstone at a depth of 48 inches. Soil characteristics include rapid permeability, and roots typically penetrate to a depth of 60 inches or more.

The near-surface site soils are subject to surficial weather that produces soils of distinct character based on age, type of parent material, slope conditions, and other factors (HKA, 2004). While the U.S. Department of Agriculture ("USDA") Soil Conservation Service has produced soils surveys of the study area, these surveys are not necessarily representative indicators of surface soils found within the project area. (ibid.) More specifically, the stratigraphy of the underlying parent earth materials is so complex, especially within eolian deposits; surface soils often deviate from those predicted by the USDA maps. HKA performed a particle size analysis as part of the Preliminary Geotechnical Report (HKA, 2004) on individual subsoil samples. HKA's analysis revealed that the site soils consisted of approximately 78 percent sand-sized particles and 22 percent consisted of silt-clay size particles. According to the sample testing, site soils show a low to moderate plasticity characteristic that typically has a low expansion potential. Refer to **Figure 4.6-2** for the Soils Map.

At some locations of the property there is manmade fill that overlies the in-situ topsoils. This manmade fill is highly variable, consisting of basically sand with silt and clay size particles with differing proportions of each soil type at each different location. HKA also noted that in some locations that fragments of claypan or hardpan were scattered throughout the fill. These soils will need to be removed together with loose topsoils across the development. According to HKA, it is conceivable these soils can be replaced as engineered fill.

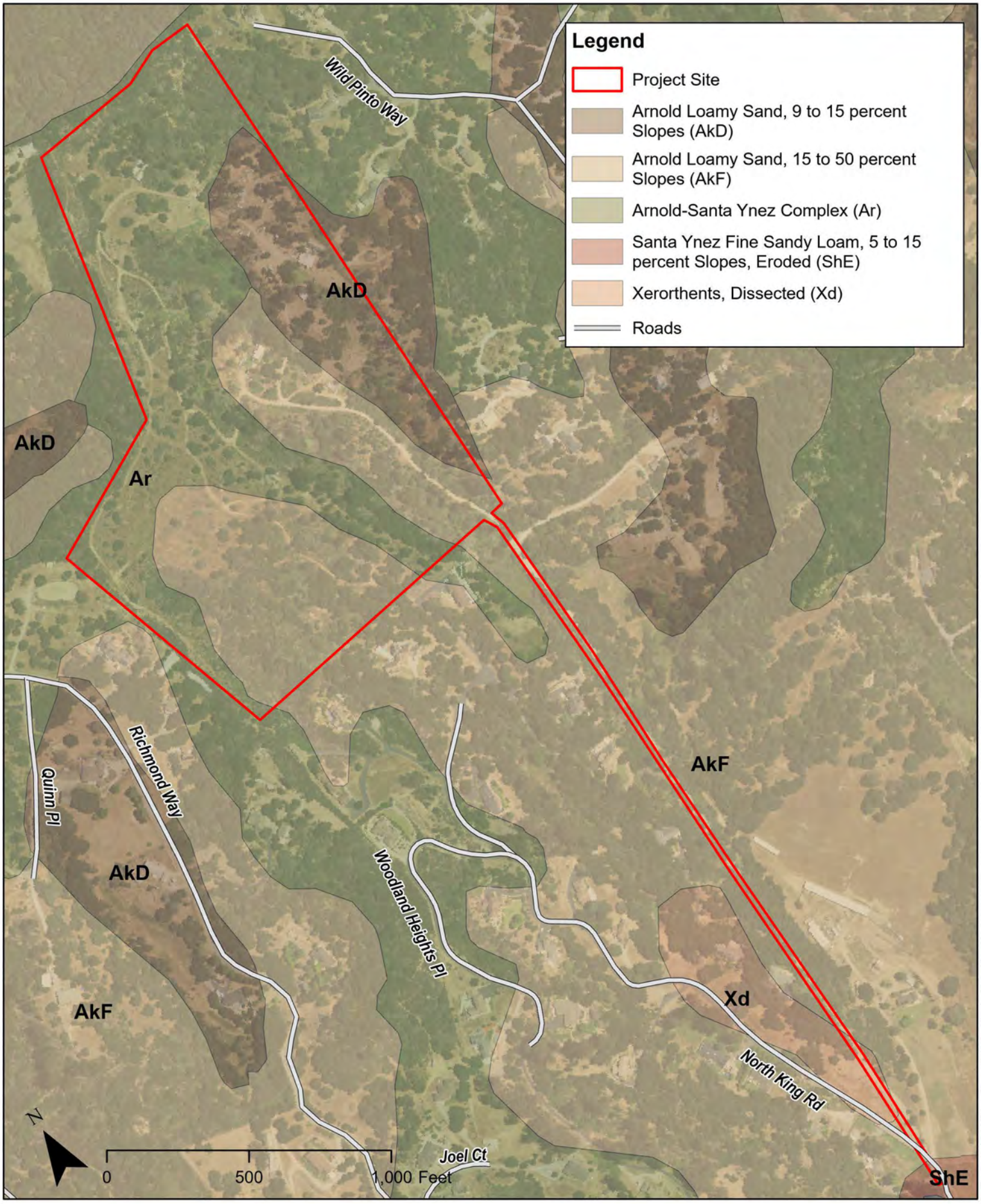
The Project site is located in an area with high erosion potential, refer to **Figure 4.6-3**. Where the land has been cleared of vegetation, it also has been disked and/or plowed. By this process, the topsoils have been highly disturbed and very loose soil conditions exist within one or more feet of the topsoils. These soils will need to be reprocessed and compacted to help minimize soil erosion.

4.6.2.5 Topography

The Project site is on the south-facing slopes of Pesante Creek Canyon and is dominated by gentle rolling hills with occasional steep to moderately steep flanks, cut by several broad, flat-bottomed drainages and numerous narrow sidehill drainage swales (HKA, 2004). The Project site is relatively steep with slopes ranging from eight (8) to 25 percent. The side hill swales drain into the larger, flat-bottomed drainages. The two (2) large flat-bottomed drainages drain south, intersecting with one another off-site at the base of the hill approximately 0.4 mile or near Pesante Road. Portions of the rolling hills have been extensively disked. Elevations range up to 480 feet above mean sea level. Refer to **Figure 4.6-4** for the Topographic Index Map.

4.6.2.6 Drainage

Most of the natural surface drainage on the Project site occurs primarily as overland sheet flow, which is eventually captured by large flat-bottomed drainages (HKA, 2004). According to HKA, drainage within the flat-bottomed drainages naturally meanders into gullies and man-made drainages. Refer to **Figure 4.6-5**. There is an existing small pond that is located across the flat-bottomed drainage on the property, although its effectiveness at retaining water appears to be limited due to the high transmissivity of the underlying sediments and dam faces (HKA, 2004). The majority of surface drainage is eventually funneled toward the southern edge of the property via two (2) flat-bottomed drainages that eventually intersect the drainage of Pesante Canyon. (HKA, 2004) The south-flowing flat-bottomed drainage near the north end of the property continues southward into the Woodland Heights Subdivision.



Soils Map

Date 6/29/2022

Scale 1:5,200

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure 4.6-2

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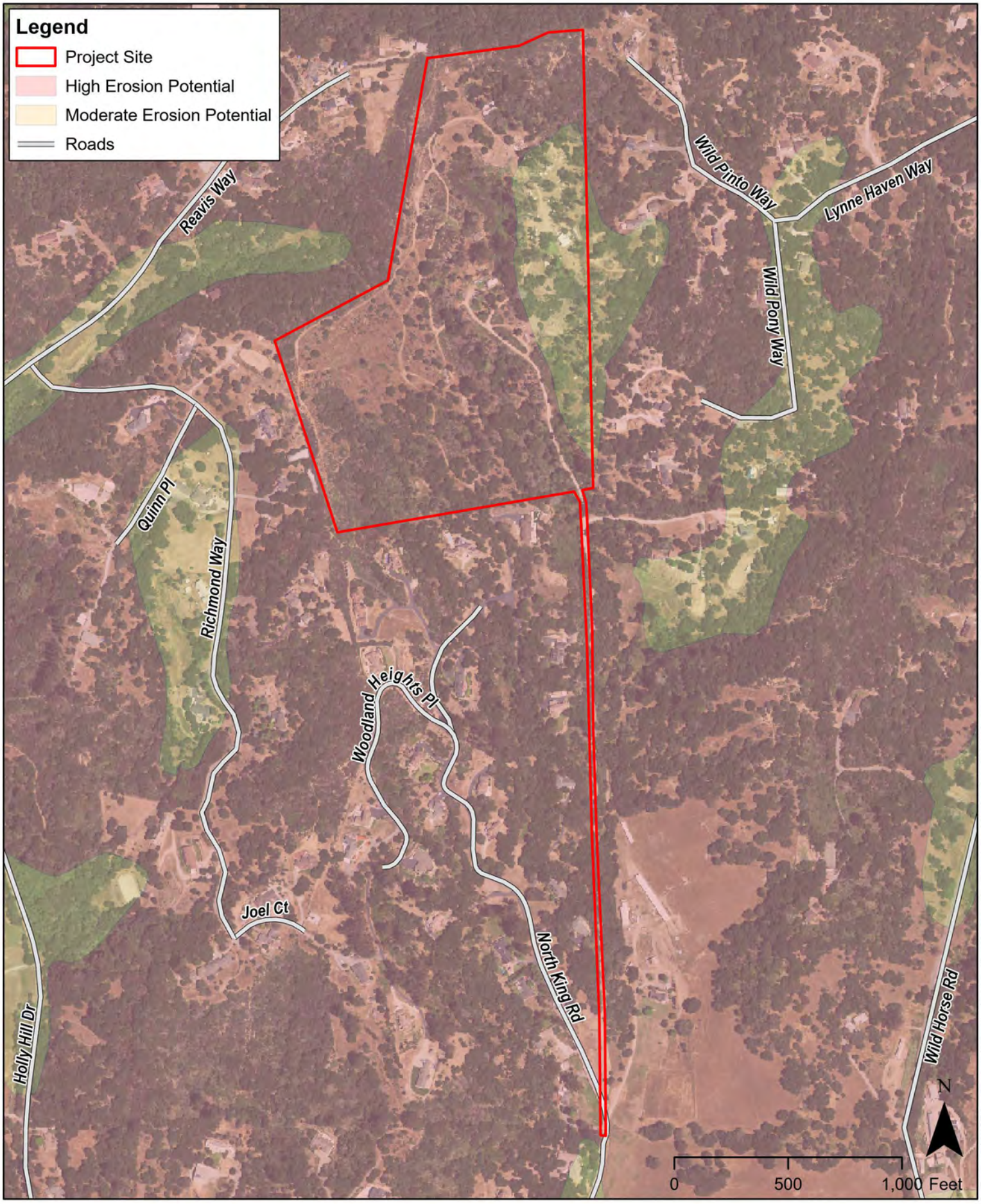

Erosion Potential Map

Date
6/29/2022

Scale
1:6,500

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure
4.6-3

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Topographic Index Map

Date
6/29/2022

Scale
1:15,000

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure
4.6-4

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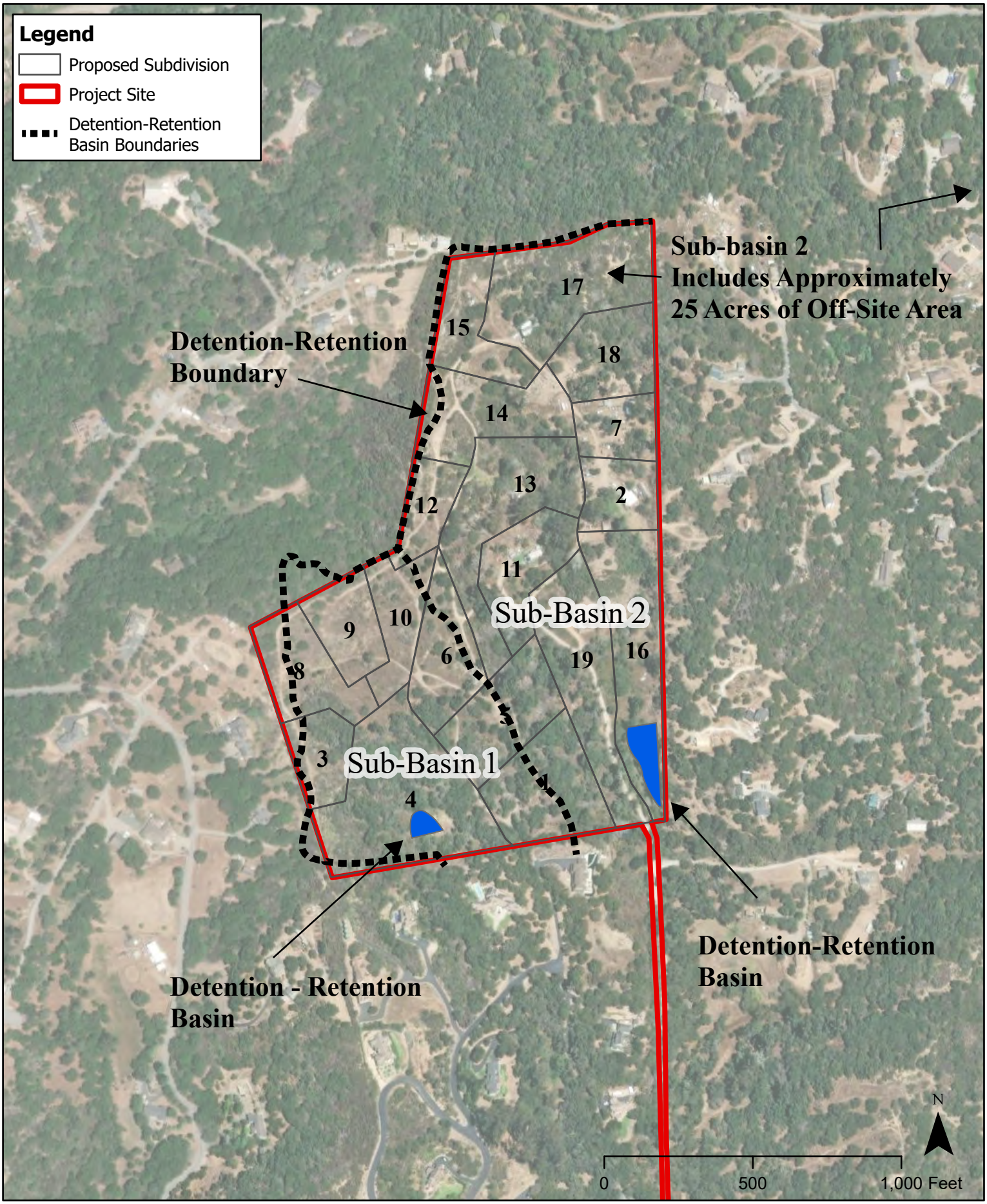

Project Site Drainage

Date 7/1/2022

Scale 1:5,000

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure 4.6-5

Source: Questa Engineering Corporation, March 2007

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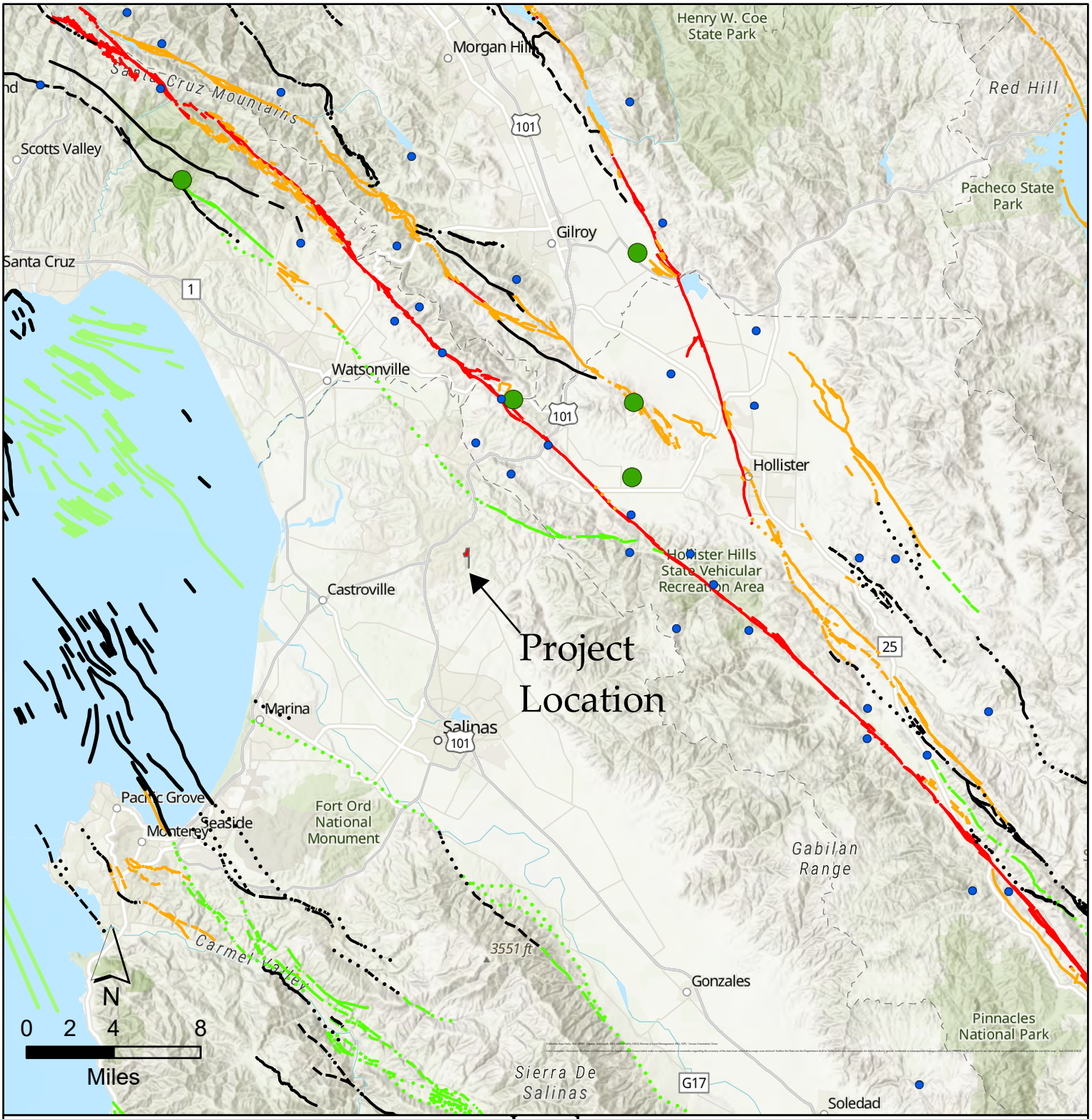
4.6.2.7 Geologic Hazards

Seismicity. The Project site is within a generally active seismic area. Seismic shaking on the property will be intense during the next major earthquake along one of the local fault systems. Modified Mercalli Intensities (see **Table 4.6-2**) of up to IX are possible on the property based on intensities reported for previous earthquakes. The modified Mercalli scale measures the intensity of ground shaking as determined from observations of an earthquake's effect on people, structures, and the Earth's surface. Richter magnitude is not reflected. This scale assigns to an earthquake event a Roman numeral from I to XII as shown on **Table 4.6-2**. The potential of earthquake damage from ground shaking is moderate to high in the Project vicinity. The site is located in Seismic Hazard Zone 4[1], which indicates that the area is near a great fault and is considered for structural design purposes to be subjected to ground shaking severity of 0.4g (NRC, 2015). Most earthquakes in the area are linked to the San Andreas Fault (Pajaro segment), which is approximately 6.61 miles northeast of the Project site. The site is not located in an Alquist-Priolo Earthquake Fault Zone. Additionally, there are no known faults that cross the site. Thus, the potential for fault rupture at the Project site is low (HKA, 2004). Refer to **Figure 4.6-6** for the Regional Seismicity Map.

Table 4.6-2
Modified Mercalli Intensity Scale

Mercalli Scale	Description
I	Not felt by people, except rarely under especially favorable circumstances.
II	Felt indoors only by persons at rest, especially on upper floors. Some hanging objects may swing.
III	Felt indoors by several. Hanging objects may swing slightly. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	Felt indoors by many, outdoors by few. Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing automobiles rock. Windows, dishes, doors rattle. Wooden walls and frame may creak.
V	Felt indoors and outdoors by nearly everyone; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset; some dishes and glassware broken. Doors swing; shutters, pictures move. Pendulum clocks stop, start, change rate. Swaying of tall trees and poles sometimes noticed.
VI	Felt by all. Damage slight. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks and books fall off shelves; pictures off walls. Furniture moved or overturned. Weak plaster and masonry cracked.
VII	Difficult to stand. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary buildings; considerable in badly designed or poorly built buildings. Noticed by drivers of automobiles. Hanging objects quiver. Furniture broken. Weak chimneys broken. Damage to masonry; fall of plaster, loose bricks, stones, tiles, and unbraced parapets. Small slides and caving in along sand or gravel banks. Large bells ring.
VIII	People frightened. Damage slight in specially designed structures; considerable in ordinary substantial buildings, partial collapse; great in poorly built structures. Steering of automobiles affected. Damage or partial collapse to some masonry and stucco. Failure of some chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed pilings broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	General panic. Damage considerable in specially designed structures; great in substantial buildings, with some collapse. General damage to foundations; frame structures, if not bolted, shifted off foundations and thrown out of plumb. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground; liquefaction.
X	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Landslides on river banks and steep slopes considerable. Water splashed onto banks of canals, rivers, lakes. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	Few, if any masonry structures remain standing. Bridges destroyed. Broad fissures in ground; earth slumps and landslides widespread. Underground pipelines completely out of service. Rails bent greatly.
XII	Damage nearly total. Waves seen on ground surfaces. Large rock masses displaced. Lines of sight and level distorted. Objects thrown upward into the air.

[1] The seismic zone system used for building codes is now obsolete. The last map generated by USGS was published in 1969. In 1997, California published the Uniform Building Code, which is the only building code that still utilized the zones (USGS, 2019).



Legend

Historic Earthquakes, 1769-2015 - California (Magnitude 5.0 Plus)

magnitude

- 5 - 6
- 6 - 7
- 7+

Quaternary Faults

Based on time of most recent surface deformation

- historical (<150 years), well constrained location
- historical (<150 years), moderately constrained location
- historical (<150 years), inferred location
- latest Quaternary (<15,000 years), well constrained location
- latest Quaternary (<15,000 years), moderately constrained location
- latest Quaternary (<15,000 years), inferred location
- late Quaternary (<130,000 years), well constrained location
- late Quaternary (<130,000 years), moderately constrained location
- late Quaternary (<130,000 years), inferred location
- middle and late Quaternary (<750,000 years), well constrained location
- middle and late quaternary (<750,000 years), moderately constrained location
- middle and late Quaternary (<750,000 years), inferred location
- undifferentiated Quaternary(<1.6 million years), well constrained location
- undifferentiated Quaternary(<1.6 million years), moderately constrained location
- undifferentiated Quaternary(<1.6 million years), inferred location
- Class B (various age), well constrained location
- Class B (various age), moderately constrained location
- Class B (various age), inferred location

Regional Seismicity Map

Date: 6/14/2022

Scale: 1:400,000

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure 4.6-6

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Liquefaction. Liquefaction is the transformation of soil from a solid to a liquid state as a consequence of increase pore-water pressures, usually in response to strong ground shaking, such as those generated during a seismic event. Loose, granular soils are most susceptible to these effects while more stable, silty clay and clay materials are generally somewhat less affected. HKA did not observe evidence of difference settlement, lurch cracking or lateral spreading on the Project site during HKA's aerial photo analysis or site reconnaissance. However, any evidence of past liquefaction may have been obscured by agricultural activities on the Project site (HKA, 2004).

Most of the Project site has a low susceptibility to liquefaction except for a small finger of deposits near the southeastern corner of the site that has a moderate susceptibility to liquefaction. This area of elevated liquefaction susceptibility corresponds to the area mapped as Colluvium by HKA. While others mapped this area as alluvial deposits, HKA concluded that the very loose to loose sand encountered in this area (boring B-11) may liquefy if subjected to intense seismic shaking when saturated. HKA concluded that the potential for liquefaction to occur within the lifetime of the development is moderate for the areas underlain by Colluvium, and low for most of the Project site (HKA, 2004). Refer to **Figure 4.6-7** for the Liquefaction Potential Map.

Soil Expansion. Expansive soils shrink and swell as a result of moisture changes. This can cause heaving and cracking of slabs-on-grade, pavement, and structures founded on shallow foundations. The site soils are classified as silty sand and poorly graded sand and are considered to be non-plastic. Review of the Soil Survey of Monterey County shows the site to be underlain by Arnold Series Soils. The risk of soil expansion on foundations and interior or exterior concrete slabs-on-grade is low (HKA, 2004)

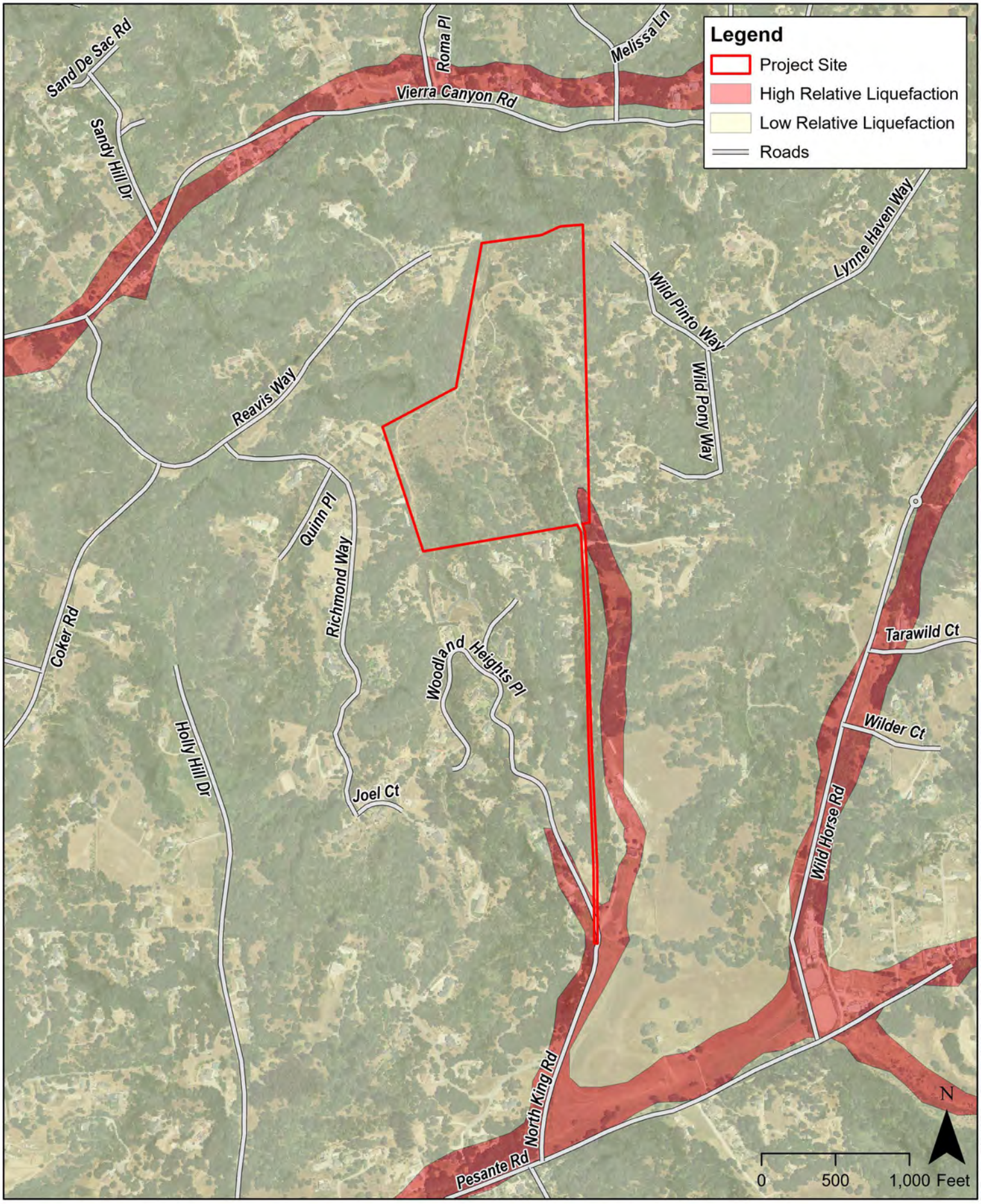
Landsliding. HKA did not observe any evidence of landslide deposits or scars on the Project site. As a result, the potential for landslides to occur on the native slopes is low for the lifetime of the Proposed Project. However, it is important to note that relative slope stability issues may arise in the future, depending upon final grading for proposed subdivision improvements and grading on individual lots. Construction of the Proposed Project will comply with recommendations of the design-level geotechnical report and standard County practices to minimize landsliding hazards.

4.6.3 REGULATORY ENVIRONMENT

4.6.3.1 State

Alquist-Priolo Earthquake Fault Zoning Act: The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The State Geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Because many active faults are complex and consist of more than one (1) branch, each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace.

Title 14 of the California Code of Regulations ("CCR"), Section 3601(e), defines buildings intended for human occupancy as those that would be inhabited for more than 2,000 hours per year. The Proposed Project does not cross an Alquist-Priolo Earthquake Fault Zone. Therefore, the provisions of the Act do not apply to the Project.



Liquefaction Potential Map

Date: 6/29/2022

Scale: 1:10,000

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure 4.6-7

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Seismic Hazards Mapping Act: Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (Public Resources Code ["PRC"] Sections 2690 to 2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong ground shaking, liquefaction, and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act. The state is charged with identifying and mapping areas at risk of strong ground shaking, liquefaction, landslides, and other corollary hazards. Cities and counties are required to regulate development within mapped Seismic Hazard Zones.

Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites within Seismic Hazard Zones until appropriate site-specific geologic and/or geotechnical investigations have been conducted and measures to reduce potential damage have been incorporated into the development plans. There are no jurisdictions within Monterey County that are included within the State Seismic Hazards Mapping Act.

California and Uniform Building Code (Title 24). The California Building Code ("CBC"), which is codified in CCR Title 24, Part 2, was promulgated to safeguard public health, safety, and general welfare by establishing minimum standards related to structural strength, egress facilities, and general building stability. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. The 2019 California Building Standards Code ("CBSC") was published on July 1, 2019 and took effect on January 1, 2020. The CBSC is a compilation of three (3) types of building criteria from three different origins:

- Building standards that have been adopted by state agencies without change from building standards contained in national model codes;
- Building standards that have been adopted and adapted from the national model code standards to meet California conditions; and
- Building standards, authorized by the California legislature, that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns.

The CBSC identifies acceptable design criteria for construction that addresses seismic design and load-bearing capacity, including specific requirements for seismic safety; excavation, foundation and retaining wall design, site demolition, excavation, and construction, and; drainage and erosion control. Changes in the 2019 California Building Standards Code provide enhanced clarity and consistency in application. The basis for most of these changes resulted from California amendments to the 2018 model building codes. Some of the most significant changes include the following:

- Aligns engineering requirements in the building code with major revisions to national standards for structural steel and masonry construction, minor revisions to standards for wood construction, and support and anchorage requirements of solar panels in accordance with industry standards;
- Clarifies requirements for testing and special inspection of selected building materials during construction; and
- Recognizes and clarifies design requirements for buildings within tsunami inundation zones.

The earthquake design requirements consider the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, all of which are used to determine a Seismic Design Category ("SDC") for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC.

Storm Water Pollution Prevention Plan: Construction activity that disturbs one or more acres of soil, or less than 1 acre but is part of a larger common plan of development that in total disturbs one or more acres, must obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ). Construction activity subject to this permit includes clearing, grading, and 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 a facility. The Construction General Permit requires developing and implementing a Storm Water Pollution Prevention Program ("SWPPP"). The SWPPP includes construction mitigation measures such as desilting basins, silt fences, hydroseeding of slopes, and monitoring and clean-up requirements.

4.6.3.2 Local

Monterey County 1982 General Plan. The County of Monterey General Plan provides policies to prevent hazards related to geology and soils related impacts. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing,** for a detailed analysis of the Project's consistency with the County's geology and soils-related policies. Relevant policies are listed below:

3.1.1 Erosion control procedures shall be established and enforced for all private and public construction and grading projects.

3.2.2 Land having a prevailing slope above 30 percent shall require adequate special erosion control and construction techniques.

3.2.4 Except in areas designated as medium or high density residential or in areas designated as commercial or industrial where residential use may be allowed, the following formula shall be used in the calculation of maximum possible residential density for individual parcels based upon slope:

- Those portions of parcels with cross-slope of between zero and 19.9 percent shall be assigned 1 building site per each 1 acre.
- Those portions of parcels with a cross-slope of between 20 and 29.9 percent shall be assigned 1 building site per each 2 acres.
- Those portions of parcels with a cross-slope of 30 percent or greater shall be assigned zero building sites.
- The density for a particular parcel shall be computed by determining the cross-slope of the various portions of the parcel applying the assigned densities listed above according to the percent of cross-slope and by adding the densities derived from this process. The

maximum density derived by the procedure shall be used as one of the factors in final determination of the actual density that shall be allowed on a parcel.

Where an entire parcel would not be developable because of plan policies, an extremely low density of development should be allowed.

15.1.2 Faults classified as "potentially active" shall be treated the same as "active faults" until geotechnical information demonstrating that a fault is not "active" is accepted by the County.

15.1.3 The lands within one eighth mile of active or potentially active faults shall be treated as a fault zone until accepted geotechnical investigations indicate otherwise.

15.1.4 All new development and land divisions in designated high hazard zones shall provide a preliminary seismic and geologic hazard report which addresses the potential for surface ruptures, ground shaking, liquefaction and landslides before the application is considered complete. This report shall be completed by a registered geologist and conform to the standards of a preliminary report adopted by the County.

15.1.5 A detailed geological report shall be required for all standard subdivisions. In high hazard areas, this report shall be completed by a registered geologist, unless a waiver is granted, and conform to the standards of a detailed report adopted by the County.

15.1.7 Prior to the issuance of a building or grading permit, the County shall require liquefaction investigations for proposed critical use structures and multi-family dwellings over four units when located in areas of moderate or high hazard for liquefaction or subject to the following conditions:

- location in primary floodways; and
- groundwater levels less than 20 feet, as measured in spring and fall.

15.1.8 The County should require a soils report on all building permits and grading permits within areas of known slope instability or where significant potential hazard has been identified.

15.1.10 All structures and private utility lines shall be designed and constructed to conform to the standards of the latest adopted Uniform Building Code.

15.1.11 For high hazard areas, the County should condition development permits based on the recommendations of a detailed geological investigation and soils report.

15.1.12 The County shall require grading permits to have an approved site plan which minimizes grading and conforms to the recommendations of a detailed soils or geology investigation where required.

15.1.13 The County shall require septic leach fields and drainage plans to direct runoff and drainage away from unstable slopes.

15.1.15 Side castings from the grading of roads and building pads shall be removed from the site unless they can be distributed on the site so as not to change the natural landform. An exception to this policy will be made for those cases where changes in the natural landform are required as a condition of development approval.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The NCAP provides policies for the protection of people from geology and soils related hazards of the area. Please refer to **Table 4.10-5** in **Section 4.10, Land Use, Population, and Housing,** for a detailed analysis of the Project's consistency with the NCAP's geology and soils hazard policies. Relevant policies are listed below:

3.1.4 (NC) Where any land use activity results in repeated, excessive runoff or soil erosion, the County shall require that the problems created by such activities be remedied by the property owner. For the purposes of this policy, excessive runoff and/or erosion are defined as that in excess of the runoff or erosion produced from the land under undisturbed conditions. All landowners shall be encouraged to retain runoff and eroded soil on-site, but where this is not feasible, sufficient improvements must be made to prevent alteration of or damage to, natural drainage channels and downstream property. For each violation the County shall set a time period of up to two years to allow conformance with this policy. Should runoff and erosion problems continue beyond the established time period the County may issue an order to discontinue the land use activity and convert the property to a less intensive land use.

3.2.4 (NC) Except in areas designated as medium or high density residential or in areas designated as commercial or industrial where residential use may be allowed, the following formula shall be used in the calculation of maximum possible residential density for individual parcels based upon slope:

1. Those portions of parcels with cross-slope of between zero and 19.9 percent shall be assigned 1 building site per each 1 acre.
2. Those portions of parcels with a cross-slope of between 20 and 29.9 percent shall be assigned 1 building site per each 2 acres.
3. Those portions of parcels with a cross-slope of 30 percent or greater shall be assigned zero building sites.
4. The density for a particular parcel shall be computed by determining the cross-slope of the various portions of the parcel, applying the assigned densities listed above according to the percent of cross-slope, and by adding the densities derived from this process. The maximum density derived by the procedure shall be used as one of the factors in final determination of the actual density that shall be allowed on a parcel.

Where an entire parcel would not be developable because of plan policies, an extremely low density of development should be allowed.

15.1.1.1 (NC) The North County Seismic Hazards Map shall be used to delineate high seismic hazard areas addressed by policies in the General Plan.

16.2.1.1 (NC) Site plans for new development shall indicate all perennial or intermittent streams, creeks, and other natural drainages. Development shall not be allowed within these drainage courses, nor shall development be allowed to disturb the natural banks and vegetation along these drainage courses, unless such disturbances are with approved flood or erosion control or water conservation measures.

16.2.11 (NC) New development in North County shall be required to limit peak storm runoff to pre-project or pre-soil disturbance levels, unless otherwise dictated by the Monterey County Flood Control and Water Conservation District (MCFCWCD).[2] Runoff shall be limited by construction of detention ponds or other approved measures. In areas where the potential for erosion also exists, detention ponds shall be constructed for the dual process of storm water detention and sediment control.

Monterey County Code. Regulations governing grading and erosion control are covered under two (2) separate ordinances in Chapters 16.08 and 16.12 of the Monterey County Code. These ordinances address standards for all grading activities. These ordinances help to maintain safe grading conditions and erosion control that could otherwise have potentially harmful impacts to property, the public, and environmental health. Slope failure or bank collapses due to improper grading and erosion of sediment into waterways are two (2) critical hazards.

Chapter 16.08 (Grading) of the Monterey County Code sets rules and regulations to control grading, including excavations, earthwork, road construction, fills and embankments; establishes the administration procedure for issuance of permits; and provides for approval of plans and inspections of grading construction. The County Grading Ordinance generally regulates grading activities that involve more than 100 cubic yards of excavation and fill. An excavation which does not exceed 100 cubic yards, and which is less than two (2) feet in depth, or which does not create a cut slope greater than five (5) feet in height and steeper is exempt from grading regulations. The Monterey County Grading Ordinance requires a soil engineering and engineering geology report (Section 16.08.110: Permit – Soil Engineering and Engineering Geology Reports [Ordinance 4029, 1999; Ordinance 2534, Section 110, 1979], unless waived by the Building Official because information of record is available showing such data is not needed.

Chapter 16.12 (Erosion Control) of the Monterey County Code sets forth required provisions for project planning, preparation of erosion control plans, runoff control, land clearing, and winter operations, and establishes procedures for administering those provisions. Chapter 16.12 requires that specific design considerations be incorporated into projects to reduce the potential of erosion and that an erosion control plan be approved by the County prior to initiation of grading activities.

[2] Monterey County Flood Control and Water Conservation District is now the Monterey County Water Resources Agency. https://www.countyofmonterey.gov/government/government-links/water-resources-agency/.

4.6.4 IMPACTS AND MITIGATION MEASURES

4.6.4.1 Thresholds of Significance

A project impact would be considered significant if the project would:

a. Directly or indirectly cause potential substantial adverse effects, included the risk of loss, injury, or death involving:
    1. 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,
    2. Strong seismic ground shaking,
    3. Seismic-related ground failure, including liquefaction, or
    4. Landslides;
b. Result in substantial soil erosion or the loss of topsoil;
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;
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for disposal of wastewater;[3] or
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

4.6.4.2 Areas of No Impact

Some of the significance criteria outlined above (f) are not applicable to the Proposed Project, or the Proposed Project would not result in impacts related to these criteria, as explained below. The impact analyses related to the other criteria (a, b, c, d, and e) are addressed below under **Section 4.6.4.3 Impact Analysis.**

f. *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.* A review of nearly 700 known fossil localities within the County was conducted by paleontologists in 2001; 12 fossil sites were identified as having outstanding scientific value (Rosenberg, 2001). The Project site is not located on or near any of these sites, nor does the Project site contain any unique geologic features.

4.6.4.3 Methodology

The following impact evaluation is based on the findings and recommendations contained in Preliminary Geologic and Geotechnical Report (HKA, 2004), information contained in the Monterey County General Plan (Monterey County, 1982), and the North County Area Plan (Monterey County, 1985). The field investigation performed by HKA included the drilling and collection of 12 exploratory borings from the Project site. HKA

[3] This threshold is discussed in **Section 4.15, Wastewater Disposal**.

visually classified soils encountered in each exploratory boring were in the field and sent the soils for laboratory testing to determine physical and engineering characteristics. The *Preliminary Geologic and Geotechnical Report* is included as **Appendix I** of this EIR.

4.6.4.4 Impact Analysis

Impact GS-1: Seismic ground shaking at the Project site may occur during the next major earthquake on a regional fault system. Such shaking can cause severe damage to or collapse of building or other Project facilities and may expose people to injury or death. The Project site is in a seismically active region and could expose people and structures to potential adverse effects. This would represent a potentially significant impact that could be reduced to a less than significant level with implementation of the recommended mitigation measures. (Criterion a).

The Proposed Project is in a seismically active region and could be subject to strong seismic ground shaking during the Project's design lifetime. As a result, the Project could be exposed to potential seismically induced hazards. More specifically, the Project could expose people and/or structures to potential adverse effects, including the risk of loss, injury, or death due to a rupture of a known fault, strong seismic shaking, seismic induced ground failure, and landslides.

Seismic shaking at the Project site may be intense during the next major earthquake along one of the local fault systems. The intensity of seismic ground shaking is typically characterized as the peak acceleration that a point on the ground experiences during the shaking. Acceleration is measured as a proportion of the acceleration of the Earth's gravity ("g"). The Zayante (-Vergeles) fault, 2.41 miles northeast of the Project site, is expected to generate the largest ground motion at the site (HKA, 2004). According to HKA, the Project site's expected mean earthquake ground acceleration may be as high as 0.60 g, and the maximum earthquake ground motion expected at the property is approximately 0.94 g. The expected duration for the design earthquake on the Zayante (-Vergeles) fault is about 13 seconds. However, given the recurrence intervals ("RI") of the San Andreas (RI = 210 years) and Zayante (-Vergeles) (RI = 10,000 years) faults, the Project site is more likely to experience the characteristic event on the San Andreas Fault, which is located approximately 6.61 miles from the Project site. A maximum earthquake ("M_W") of 7.9 on the San Andreas fault would generate an estimated peak ground acceleration of 0.51 g and a maximum earthquake ground motion of approximately 0.77 g, lasting approximately 38 seconds (HKA, 2004).

During the Project's life, the Proposed Project would be subject to seismic hazards, such as ground accelerations, ground shaking, and liquefaction. All structures within Monterey County, including the Proposed Project, are required to be designed in accordance with the latest edition of the California Building Code. As a result, final design of project-related improvements would be required to comply with the requirements of the applicable provisions of the California Building Code in effect at the time of building permit issuance. Similarly, the design all of project-related improvements would also be required to comply with the recommendations of a design-level geotechnical report, which would identify site-specific recommendations to address potential seismic-related hazards. **This is considered a potentially significant impact that could be mitigated to a less than significant level through the implementation of the following mitigation measures identified below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure GS-1:

Prior to the issuance of any grading or building permit, the Applicant shall submit a design-level geotechnical report that is consistent with the most current version of the California Building Code in effect at the time of building permit issuance. The design-level geotechnical report shall consider previous recommendations contained in the Preliminary Geologic and Geotechnical Report prepared by HKA (2004) and shall provide additional site-specific recommendations, where appropriate. The project-specific geotechnical analysis shall be performed by a registered professional engineer with geotechnical expertise, and all recommendations incorporated into final design plans, subject to review of the County of Monterey – HCD Planning. The requirements of this mitigation measure shall be included as a "Note" on the final map and shall also be included as a "Note" on all subdivision improvement plans.

Impact GS-2: Construction of the Project could result in substantial soil erosion or loss of topsoil. Extensive grading on the site to facilitate the Project-related infrastructure could result in substantial erosion or loss of topsoil. This is a potentially significant impact that could be reduced to a less than significant level with implementation of the recommended mitigation measures. (Criterion b).

Construction of the Proposed Project could result in substantial soil erosion or the loss of topsoil. Project development would require grading on the site to facilitate the construction of Project-related infrastructure. Proposed grading would occur throughout most of the site and would involve approximately 9,220 cubic yards ("CY") of cut and 6,410 cubic yards of fill to accommodate proposed subdivision improvements. All grading is proposed to balance. Severe erosion is common in the sandy soils present in the region, especially where natural drainages have been modified and not properly controlled (HKA, 2004). As a result, site preparation and construction activities would disturb soil and increase its susceptibility to erosion. Removal of soils by wind or water can undermine buildings, roads, and other development and contribute to the siltation of local streams or water bodies. Erosion impacts can result from both short-term construction activities and long-term Project conditions where vegetative cover is not re-established following development. All ground-disturbing activities would be subject to Monterey County erosion control requirements, including re-planting of disturbed areas, watering, and other physical erosion control methods. The Project would be required to implement an Erosion Control Plan and standard construction Best Management Practices ("BMPs") to minimize temporary increases in erosion during construction consistent with the requirements of Monterey County Code Chapters 16.08 - Grading and 16.12 – Erosion Control. The removal and disturbance of soil during grading activities would directly affect the rate of erosion. Therefore, short-and long-term erosion potential at the Project site would be considered a potentially significant impact.

As discussed above, future ground-disturbing activities will be required to comply with applicable Monterey County Code requirements contained in Chapter 16.08 and 16.12. Compliance with these requirements will ensure that potential construction-related erosion is minimized and that standard BMPs will be implemented during construction. Furthermore, all grading operations will be required to comply with Monterey County Code section 16.12.080, Land Clearing, and the Applicant will be required to submit detailed project-level

grading plans to the County consistent with Monterey County Code section 16.08.100. Moreover, as noted above, all future development on the site will be required to comply with the recommendations of a design-level geotechnical report (see **Mitigation Measure GS-1**). While compliance with existing Monterey County Code requirements will ensure that potential erosion related effects are minimized, additional mitigation is necessary to ensure that impacts are reduced to a less than significant level. **This represents a potentially significant impact that could be mitigated to a less than significant level through the implementation of the following mitigation measures identified below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure GS-2a:

Prior to the issuance of any grading permit for proposed subdivision improvements and grading of the proposed building envelopes, the Applicant shall submit an Erosion Control Plan and a Storm Water Pollution Prevention Plan ("SWPPP") prepared in accordance with Regional Water Quality Control Board standards to the County of Monterey for review. The Erosion Control Plan and SWPPP shall document best management practices to be implemented to ensure that contaminated runoff and sediment are minimized during site preparation, construction, and post-construction periods. The Erosion Control Plan and SWPPP shall incorporate best management practices consistent with the requirements of the National Pollutant Discharge Elimination System ("NPDES") and Monterey County Code section 16.12.80, Land Clearing.

Prior to the issuance of any grading permit, the Applicant shall submit an Erosion Control Plan and a copy of the approved SWPPP, including the Waste Discharge Identification Number, to County of Monterey HCD – Environmental Services for review and approval. The requirements of this mitigation measure shall be included as a "Note" on the final map and shall also be included as a "Note" on all subdivision improvement plans.

Mitigation Measure GS-2b:

Prior to the issuance of any grading and building permits for each residential lot and subdivision improvements, the Applicant shall submit a re-vegetation and landscaping plan prepared by a qualified landscape architect. All replanting shall consist of native and drought tolerant plants that shall be subject to the review and approval of County of Monterey HCD-Planning. The re-vegetation and landscaping plan shall indicate where areas disturbed by grading shall be stabilized with landscaping vegetative cover. This re-vegetative and landscaping plan is subject to the review and approval of the County of Monterey HCD-Planning. The requirements of this mitigation measure shall be included as a "Note" on the final map and shall also be included as a "Note" on all subdivision improvement plans.

Impact GS-3: The Proposed Project could result in potential geologic hazards due to soils that are unstable or could become unstable as a result of landslides, lateral spreading, expansive soils, liquefaction, and localized subsidence. While the Proposed Project would likely not result in on-or-off site landslides or induce lateral spreading, there is risk of subsidence, liquefication, and collapse in isolated areas. This would represent

a potentially significant impact that could be reduced to a less than significant level with implementation of the recommended mitigation measures. (Criteria c-d).

The Proposed Project could result in potential geologic hazards due to unstable soils or soils that could become unstable and potentially result in on- or off-site landslide, lateral spreading, subsidence, expansive soils, liquefaction, or collapse. Although unlikely, potential geological hazards could occur in isolated areas within the Project site as detailed below.

Specifically, there is a risk of potential subsidence, liquefaction, and collapse in isolated areas of the site. There is no indication of past slope instability at the Project site (HKA, 2004). HKA did not observe any historical landslides or lateral spreading, including landslide deposits or scars, on-site. Further, HKA determined that the potential for landsliding to occur on the native slopes is low for the lifetime of the Proposed Project. Similarly, the potential for lateral spreading was also considered low (ibid). Accordingly, the Project would likely not result in on- or off-site landslides or induce lateral spreading. The following discussion address potential subsidence, liquefaction, and collapse hazards that could occur on the site.

As discussed above, there is a risk of subsidence, liquefaction, and collapse in isolated areas of the Project site. HKA did not identify any evidence indicating past liquefaction-induced geological hazards, including lateral spreads, flow failures, ground oscillations, or loss of bearing strength documented on-site (HKA, 2004). Moreover, most of the Project site is characterized as having a low susceptibility of a liquefaction-induced hazard. However, one (1) isolated area on the site has been classified as having a moderate potential for liquefaction susceptibility. HKA identified isolated, and discontinuous loose to very loose sands within the southeast corner of the Project site. These soils may potentially liquefy if subjected to an intense seismic event when saturated. This is considered a potentially significant impact that can be mitigated to a less than significant level through the implementation of the following mitigation measures identified below.

The Proposed Project could also be exposed to potential hazards due to expansive soils. While HKA determined that the shrink/swell potential from moisture change is low and not a significant factor that would preclude Project development, HKA did identify isolated areas of exposed high-fine content soils on-site. As previously identified, a particle size analysis was performed on individual subsoil samples and revealed that the site soils are comprised of approximately 78 percent sand-size particles, and 22 percent consisted of silt-clay size particles. As a result, site soils show a low to moderate plasticity characteristic that typically has a low expansion potential. **Due to the potential risk to life and property, this is considered a significant impact that could be mitigated to a less than significant impact with the implementation of the following mitigation measures.**

Significance: Less than Significant with Mitigation.

Mitigation: Measures **GS-1, GS-2a,** and **GS-2b** (see above).

Mitigation Measure GS-3:

Prior to issuance of any grading or building permit, the Applicant shall submit a site-specific/design-level Supplemental Liquefaction Investigation prepared in accordance with the California Department of Mines & Geology Special Publication 117. The Supplemental Liquefaction Investigation shall include in its analysis the approved drainage plan. Engineering measures to protect development in

this area could include structural strengthening of buildings to resist predicted ground settlement, utilization of post tension or mat slab foundations or a combination of such measure as recommended in the Preliminary Geologic and Geotechnical Report prepared by HKA (2004). The requirements of this mitigation measure shall be included as a "Note" on the final map and shall also be included as a "Note" on all subdivision improvement plans.

4.6.5 REFERENCES

Haro, Kasunich and Associates, Inc. 2004. *Volume One, Preliminary Geologic and Geotechnical Report for La Tourette, a Residential Subdivision, Monterey County, California.*

County of Monterey. 2016. *Monterey County Geologic Hazards Map.* Available at: https://montereyco.maps.arcgis.com/apps/webappviewer/index.html?id=80aadc38518a45889751e97546ca5c53.

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Rosenberg, Lewis, I. and Clark, Joseph C. 2001. Paleontological Resources of Monterey County, California. Available online at: https://purl.stanford.edu/xc583rw0668.

United States Nuclear Regulatory Commission. 2015. United States Seismic Zones Map. Available at: https://www.nrc.gov/docs/ML1513/ML15131A128.pdf

4.7 GREENHOUSE GAS EMISSIONS

4.7.1 INTRODUCTION

The following section evaluates the Proposed Project's potential greenhouse gas related impacts. This section: 1) describes the existing environmental setting, 2) identifies the regulatory environment, including relevant state and local requirements, and 3) evaluates the Proposed Project's potential adverse environmental effects and identifies mitigation measures to reduce those effects, where necessary. This section is based on the following:

- Ambient Air Quality & Noise Consulting, 2018. Air Quality & Greenhouse Gas Impact Analysis for La Tourette Subdivision Project (**Appendix B**);
- Monterey Bay Air Resources District (as Monterey Bay Unified Air Pollution Control District), 2008. CEQA Air Quality Guidelines;
- Monterey Bay Air Resource District, 2016. Guidelines for Implementing the California Environmental Quality Act; and,
- Monterey Bay Air Resources District, 2017. 2012-2015 Air Quality Management Plan.

Table 4.7-1 summarizes the anticipated environmental effects of the Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.7.4, Impacts and Mitigation Measures**.

Table 4.7-1
Summary of Greenhouse Gas Emissions Environmental Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measures	Residual Impacts
GHG-1	The Proposed Project would generate temporary GHG emissions in connection with construction-related activities. In addition, the Proposed Project would also generate operational GHG emissions. GHG emissions associated with the Proposed Project would not, however, either directly or indirectly, have a significant impact on the environment. Moreover, the Proposed Project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.	Less than Significant	None	Less than Significant

4.7.2 ENVIRONMENTAL SETTING

4.7.2.1 Existing Setting

Various gases in the earth's atmosphere, classified as atmospheric Greenhouse Gases ("GHGs"), play a critical role in determining the earth's surface temperature. Solar radiation enters the 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. Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, 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. While this is a naturally occurring process, human activities have accelerated the generation of GHGs beyond natural levels. The overabundance of GHGs in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

To fully understand global climate change, it is important to recognize the naturally occurring greenhouse effect and to define the GHGs that contribute to this phenomenon. The prominent GHGs contributing to the greenhouse effect include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Primary GHGs attributed to global climate change, are discussed, as follows:

- **Carbon Dioxide.** Carbon dioxide ("CO_2") is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. Several specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere (U.S. EPA, 2018c).
- **Methane.** Methane ("CH_4") is a colorless, odorless gas that is not flammable under most circumstances. CH_4 is the major component of natural gas, about 87percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years (U.S. EPA, 2018c).
- **Nitrous Oxide.** Nitrous oxide ("N_2O") is a clear, colorless gas with a slightly sweet odor. Both natural and human-related sources produce N_2O. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from various biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years (U.S. EPA, 2018c).
- **Hydrofluorocarbons.** Hydrofluorocarbons ("HFCs") are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HCFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 270 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes of less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, has an atmospheric life of 14 years) (U.S. EPA, 2018c).

- **Perfluorocarbons.** Perfluorocarbons ("PFCs") are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane ("CF_4"), perfluoroethane ("C_2F_6"), perfluoropropane ("C_3F_8"), perfluorobutane ("C_4F_{10}"), perfluorocyclobutane ("C_4F_8"), perfluoropentane ("C_5F_{12}"), and perfluorohexane ("C_6F_{14}"). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which releases CF_4 and C_2F_6 as byproducts. The estimated atmospheric lifetimes for PFCs ranges from 2,600 to 50,000 years (U.S. EPA, 2018c).

- **Nitrogen Trifluoride.** Nitrogen trifluoride ("NF3") is an inorganic, colorless, odorless, toxic, and nonflammable gas used as an etchant in microelectronics. NF3 is predominantly used to clean the plasma-enhanced chemical vapor deposition chambers in the production of liquid crystal displays and silicon-based thin-film solar cells. While NF3 may have a lower global warming potential than other chemical etchants, it is still a potent GHG. In 2009, NF3 was listed by California as a high global warming potential GHG to be listed and regulated under Assembly Bill ("AB") 32 (Section 38505 Health and Safety Code).

- **Sulfur Hexafluoride.** Sulfur hexafluoride ("SF6") is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF6 is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF6 produced worldwide. Leaks of SF6 occur from aging equipment and during equipment maintenance and servicing. SF6 has an atmospheric life of 3,200 years (U.S. EPA 2018c).

- **Black Carbon.** Black carbon is the strongest light-absorbing component of particulate matter ("PM") emitted from burning coal, diesel, and biomass fuels. Black carbon contributes to climate change both directly by absorbing sunlight and indirectly by depositing on snow and by interacting with clouds and affecting cloud formation. Black carbon is considered a short-lived species, which can vary spatially and, consequently, it is very difficult to quantify associated global-warming potentials. The main sources of black carbon in California are wildfires, off-road vehicles (locomotives, marine vessels, tractors, excavators, dozers, etc.), on-road vehicles (cars, trucks, and buses), fireplaces, agricultural waste burning, and prescribed burning (planned burns of forest or wildlands) (CCAC, 2018; U.S. EPA, 2018c).

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule. Estimates of GHG emissions are often presented in CO_2e, which weighs each gas by its global warming potential ("GWP"). Expressing GHG emissions in CO_2e 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. **Table 4.7-2** provides a summary of the GWP for GHG emissions of typical concern with regard to community development projects, based on a 100-year time horizon. As indicated, methane traps over 25 times more heat per molecule than CO_2, and N_2O absorbs roughly 298 times more heat per molecule than CO_2. Additional GHG with high GWP includes Nitrogen trifluoride, Sulfur hexafluoride, Perfluorocarbons, and black carbon.

Table 4.7-2
Global Warming Potential for GHGs

Greenhouse Gas	Global Warming Potential (100-year)
Carbon Dioxide (CO_2)	1
Methane (CH_4)	28

Greenhouse Gas	Global Warming Potential (100-year)
Nitrous Dioxide (N_2O)	264
Nitrogen Trifluoride (NF_3)	16,100
Sulfur Hexafluoride (SF_6)	23,500
Perfluorocarbons	6,630 – 11,100

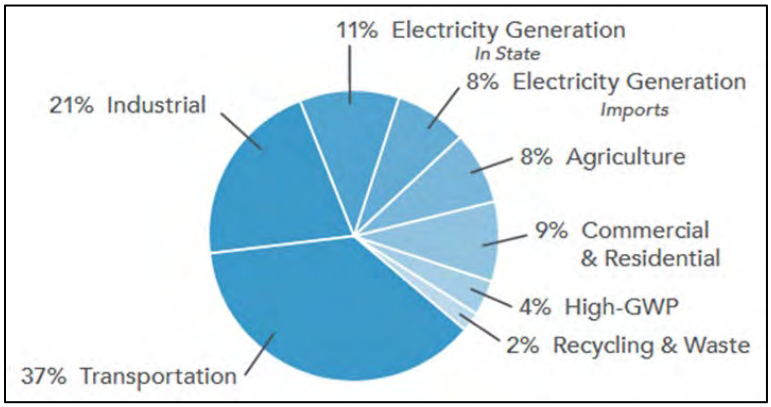
*Based on IPCC GWP values for 100-year time horizon
Source: IPCC, 2014.

4.7.2.2 Sources of GHG Emissions

On a global scale, GHG emissions are predominantly associated with activities related to energy production, changes in land use (e.g., deforestation and land clearing), industrial sources, agricultural activities, transportation, waste and wastewater generation, and commercial and residential land uses. Worldwide, energy production, including burning coal, natural gas, and oil for electricity and heat, is the largest single source of global GHG emissions (U.S. EPA, 2018c).

In 2019, GHG emissions within California totaled 418.2 million metric tons ("MMT") of CO_2e (CARB, 2021). GHG emissions, by sector, are summarized in **Figure 4.7-1**. The transportation sector is the largest contributor within California, accounting for approximately 37 percent of the total statewide GHG emissions. Emissions associated with industrial uses are the second-largest contributor, totaling roughly 21 percent. Electricity generation totaled roughly 19 percent (CARB, 2018d).

Figure 4.7-1
California GHG Emissions Inventory by Scoping Plan Sector



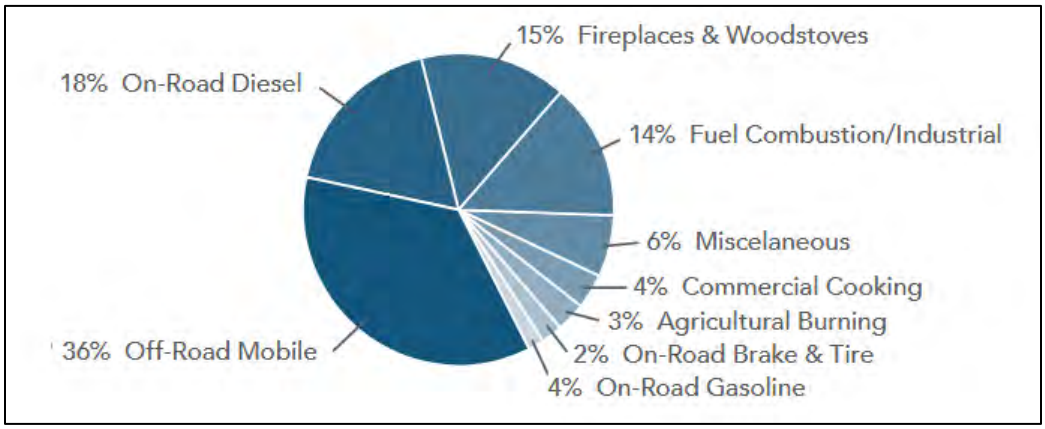
Source: CARB 2018d

Short-lived climate pollutants ("SLCPs"), such as black carbon, fluorinated gases, and methane, also dramatically affect climate change. Though short-lived, these pollutants create a warming influence on the climate that is many times more potent than that of carbon dioxide.

As part of the California Air Resources Board's ("CARB") efforts to address SLCPs, CARB has developed a statewide emission inventory for black carbon. The black carbon inventory will help support the implementation of the SLCP Strategy, but it is not part of the State's GHG Inventory that tracks progress towards the state's climate targets. The most recent inventory for the year 2013 conditions is depicted in **Figure 4.7-2**. As depicted, off-road mobile sources account for a majority of black carbon emissions totaling roughly

36 percent of the inventory. Other major anthropogenic sources of black carbon include on-road transportation, residential wood burning, fuel combustion, and industrial processes (CARB, 2018d.)

Figure 4.7-2
California Black Carbon Emissions Inventory (Year 2013)



Source: CARB 2018d

4.7.2.3 Effects of Global Climate Change

There are uncertainties as to exactly what the climate changes will be in various local areas of the earth. There are also uncertainties associated with the magnitude and timing of other consequences of a warmer planet: sea level rise, spread of certain diseases out of their usual geographic range, the effect on agricultural production, water supply, sustainability of ecosystems, increased strength and frequency of storms, extreme heat events, increased air pollution episodes, and the consequence of these effects on the economy.

Within California, climate changes would likely alter the ecological characteristics of many ecosystems throughout the state. Such alterations would likely include increases in surface temperatures and changes in precipitation's form, timing, and intensity. For instance, historical records depict an increasing trend toward earlier snowmelt in the Sierra Nevada. This snowpack is a principal water supply for the state, providing roughly 50 percent of the state's annual runoff. If this trend continues, some areas of the state may experience an increased danger of floods during the winter months and possible exhaustion of the snowpack during spring and summer months. An earlier snowmelt would also impact the state's energy resources. Currently, approximately 20 percent of California's electricity comes from hydropower. An earlier exhaustion of the Sierra snowpack, may force electricity producers to switch to more costly or non-renewable forms of electricity generation during spring and summer months. A changing climate may also impact agricultural crop yields, coastal structures, and biodiversity. As a result, resultant changes in climate will likely have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry (CCCC, 2012; PCL, 2018).

4.7.3 REGULATORY ENVIRONMENT

4.7.3.1 Federal

Federal Regulation and the Clean Air Act - Executive Order 13514. Executive Order 13514 is focused on reducing GHGs internally in federal agency missions, programs, and operations. In addition, the executive order directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

On April 2, 2007, in Massachusetts v. U.S. EPA, 549 U.S. 497 (2007), the Supreme Court found that GHGs are air pollutants covered by the FCAA and that the U.S. EPA has the authority to regulate GHG. The Court held that the U.S. EPA Administrator must determine whether or not 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.

On December 7, 2009, the U.S. EPA Administrator signed two (2) distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator found that the current and projected concentrations of the six (6) key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator found 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.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the U.S. EPA's "Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles" published on September 15, 2009. On May 7, 2010, the final "Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards" was published in the Federal Register.

U.S. EPA and the National Highway Traffic Safety Administration ("NHTSA") are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles and additional light-duty vehicle GHG regulations. President Obama outlined these steps in a Presidential Memorandum on May 21, 2010.

The final combined U.S. EPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile (the equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements). Together, these standards will cut GHG emissions by an estimated 960 MMT and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016). On August 28, 2012, U.S. EPA and NHTSA issued their joint rule to extend this national program of coordinated GHG and fuel economy standards to model years 2017 through 2025 passenger vehicles.

4.7.3.2 State

Assembly Bill 1493. AB 1493 (Pavley) of 2002 (Health and Safety Code Sections 42823 and 43018.5) requires the CARB to develop and adopt the nation's first GHG emission standards for automobiles. These standards are also known as Pavley I. The California Legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. AB 1493 cites several risks that California faces from climate change. These risks include a reduction in the state's water supply, an increase in air pollution caused by higher temperatures, harm to agriculture, an increase in wildfires, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce GHG emissions would stimulate California's economy and provide jobs. In 2004, the State of California submitted a request for a waiver from federal clean air regulations, as the state is authorized to do under the FCAA. This waiver request would allow the state to require reduced tailpipe emissions of CO_2. In late 2007, the U.S. EPA denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the state brought suit against the U.S. EPA related to this denial.

In January 2009, President Obama instructed the U.S. EPA to reconsider the Bush Administration's denial of California's and 13 other states' requests to implement global warming pollution standards for cars and trucks. In June 2009, the U.S. EPA granted California's waiver request, enabling the state to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

In 2009, President Obama announced a national policy to increase fuel economy and reduce GHG pollution for all new cars and trucks sold in the U.S. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon by 2016. When the national program takes effect, California has committed to allowing automakers who show compliance with the national program to also be deemed in compliance with state requirements. California is committed to further strengthening these standards beginning in 2017 to obtain a 45 percent GHG reduction from the 2020 model year vehicles.

Executive Order No. S-3-05. Executive Order S-3-05 (State of California) proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the secretary of the California Environmental Protection Agency ("CalEPA") to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the Governor and state legislature describing: (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the secretary of CalEPA created a Climate Action Team made up of members from various state agencies and commissions. The Climate Action Team released its first report in March 2006 and continues to release periodic progress reports. The report proposed achieving the targets by building on voluntary actions of California businesses, local government, and community actions, and through state incentive and regulatory programs.

Assembly Bill 32 - California Global Warming Solutions Act of 2006. AB 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599) requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include CO_2, CH_4, N_2O, HFCs, PFCs, NF3, and SF6. The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions that were phased in starting in 2012. AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources to effectively implement the cap. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that CARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions (CARB, 2018c).

Climate Change Scoping Plan. In October 2008, CARB published its Climate Change Proposed Scoping Plan, which is the state's plan to achieve GHG reductions in California required by AB 32. This initial Scoping Plan contained the main strategies to be implemented in order to achieve the target emission levels identified in AB 32. The Scoping Plan included CARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations were associated with improving emissions standards for light-duty vehicles, implementing the Low Carbon Fuel Standard program, implementation of energy efficiency measures in buildings and appliances, the widespread development of combined heat and power systems, and developing a renewable portfolio standard for electricity production.

The Scoping Plan states that land use planning and urban growth decisions will play important roles in the state's GHG reductions because local governments have primary authority to plan, zone, approve and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. CARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emissions sectors. With regard to land use planning, the Scoping Plan expects approximately 5.0 MMT CO_2e will be achieved with the implementation of Senate Bill 375, which is discussed further below.

The initial Scoping Plan was first approved by CARB on December 11, 2008 and is updated every five years. CARB approved the first update of the Scoping Plan on May 22, 2014, which looked past 2020 to set mid-term goals (2030-2035) on the road to reaching the 2050 goals., The most recent update released by CARB is the 2017 Climate Change Scoping Plan, which was released in November 2017. The 2017 Climate Change Scoping Plan incorporates strategies for achieving the 2030 GHG-reduction target established in S.B. 32 and EO B-30-15.

Senate Bill 1078 and Governor's Order S-14-08 (California Renewables Portfolio Standards). Senate Bill 1078 (Public Utilities Code Sections 387, 390.1, 399.25, and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum of 20 percent of their supply from renewable sources by 2017. This Senate Bill will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive

Order S-14-08, which set the Renewables Portfolio Standard target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target. Executive Order S-14-08 was later superseded by Executive Order S-21-09 on September 15, 2009. Executive Order S-21-09 directed the CARB to adopt regulations requiring 33 percent of electricity sold in the state come from renewable energy by 2020. Statute SB X1-2 superseded this Executive Order in 2011, which obligated all California electricity providers, including investor-owned utilities and publicly owned utilities, to obtain at least 33 percent of their energy from renewable electrical generation facilities by 2020.

CARB is required by current law, AB 32 of 2006, to regulate sources of GHGs to meet a state goal of reducing GHG emissions to 1990 levels by 2020, and SB 32 of 2016 to further reduce GHG emission to 40 percent below the 1990 level by 2030. The California Energy Commissions and California Public Utilities Commission serve in advisory roles to help CARB develop the regulations to administer the 40 percent by 2030 requirement. CARB is also authorized to increase the target and accelerate and expand the time frame.

Mandatory Reporting of GHG Emissions. The California Global Warming Solutions Act (AB 32, 2006) requires the reporting of GHGs by major sources to CARB. Major sources required to report GHG emissions include industrial facilities, suppliers of transportation fuels, natural gas, natural gas liquids, liquefied petroleum gas, and carbon dioxide, operators of petroleum and natural gas systems, and electricity retail providers and marketers.

Cap-and-Trade Regulation. The cap-and-trade regulation is a key element in California's climate plan. It sets a statewide limit on sources responsible for 85 percent of California's GHG emissions and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The cap-and-trade rules came into effect on January 1, 2013 and were applied to large electric power plants and industrial plants. In 2015, fuel distributors, including heating and transportation fuels distributors, also became subject to the cap-and-trade rules. At that stage, the program will encompass around 360 businesses throughout California and nearly 85 percent of the state's total GHG emissions.

Under the cap-and-trade regulation, companies must hold enough emission allowances to cover their emissions and are free to buy and sell allowances on the open market. California held its first auction of GHG allowances on November 14, 2012. California's GHG cap-and-trade system is projected to reduce GHG emissions to 1990 levels by the year 2020 and would achieve an approximate 80 percent reduction from 1990 levels by 2050.

Senate Bill 32. SB 32 was signed by Governor Brown on September 8, 2016. SB 32 effectively extends California's GHG emission-reduction goals from year 2020 to year 2030. This new emission-reduction target of 40 percent below 1990 levels by 2030 is intended to promote further GHG reductions in support of the state's ultimate goal of reducing GHG emissions by 80 percent below 1990 levels by 2050. SB 32 also directs CARB to update the Climate Change Scoping Plan to address this interim 2030 emission-reduction target.

Senate Bill 375. SB 375 requires Metropolitan Planning Organizations ("MPOs") to adopt a sustainable communities strategy ("SCS") or alternative planning strategy ("APS") that will address land use allocation in that MPOs regional transportation plan. In consultation with MPOs, CARB establishes regional reduction targets for GHGs emitted by passenger cars and light trucks for the years 2020 and 2035. These reduction targets will be updated every eight (8) years but can be updated every four (4) years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each

MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, funding for transportation projects may be withheld.

California Building Code ("CBC"). The CBC contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The California Building Code is adopted every three (3) years by the Building Standard Commission ("BSC"). In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBC standards apply statewide; however, a local jurisdiction may amend a CBC standard if it makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

Green Building Standards. In essence, green buildings standards are indistinguishable from any other building standards. Both standards are contained in the CBC and regulate the construction of new buildings and improvements. The only practical distinction between the two is that whereas the focus of traditional building standards has been protecting public health and safety, the focus of green building standards is to improve environmental performance.

AB 32, which mandates the reduction of GHG emissions in California to 1990 levels by 2020, increased the urgency around the adoption of green building standards. In its scoping plan for the implementation of AB 32, CARB identified energy use as the second largest contributor to California's GHG emissions, constituting roughly 25 percent of all such emissions. In recommending a green building strategy as one element of the scoping plan, CARB estimated that green building standards would reduce GHG emissions by approximately 26 MMT of CO_2e by 2020. Most recently, the California Energy Commission adopted new building energy efficiency standards that amends the building code to require building insulation improvements, energy-efficient lighting use, and the incorporation of renewable energy technology (e.g., solar photovoltaic systems) for newly constructed residential dwellings. These standards are anticipated to reduce energy usage by approximately 50 percent for residential buildings and 30 percent for nonresidential buildings (CEC, 2018).

Senate Bill 97. Senate Bill 97 ("S.B. 97") was enacted in 2007. S.B. 97 required OPR to develop and the Natural Resources Agency to adopt amendments to the CEQA Guidelines addressing the analysis and mitigation of GHG emissions. Those CEQA Guidelines amendments clarified several points, including the following:

- Lead agencies must analyze the GHG emissions of proposed projects and must reach a conclusion regarding the significance of those emissions.
- When a project's GHG emissions may be significant, lead agencies must consider a range of potential mitigation measures to reduce those emissions.
- Lead agencies must analyze potentially significant impacts associated with placing projects in hazardous locations, including locations potentially affected by climate change.
- Lead agencies may significantly streamline the analysis of GHGs on a project level by using a programmatic GHG emissions reduction plan meeting certain criteria.
- CEQA mandates analysis of a proposed project's potential energy use (including transportation-related energy), sources of energy supply and ways to reduce energy demand, including through the use of efficient transportation alternatives.

As part of the administrative rulemaking process, the California Natural Resources Agency developed a Final Statement of Reasons explaining the legal and factual bases, intent, and purpose of the CEQA Guidelines amendments. The amendments to the CEQA Guidelines implementing S.B. 97 became effective on March 18, 2010.

Short-Lived Climate Pollutant Reduction Strategy. In March 2017, CARB adopted the "Short-Lived Climate Pollutant Reduction Strategy" ("SLCP Strategy"), establishing a path to decrease GHG emissions and displace fossil-based natural gas use. Strategies include avoiding landfill methane emissions by reducing the disposal of organics through edible food recovery, composting, in-vessel digestion, and other processes; and recovering methane from wastewater treatment facilities, and manure methane at dairies, and using the methane as a renewable source of natural gas to fuel vehicles or generate electricity. The SLCP Strategy also identifies steps to reduce natural gas leaks from oil and gas wells, pipelines, valves, and pumps to improve safety, avoid energy losses, and reduce methane emissions associated with natural gas use. Lastly, the SLCP Strategy also identifies measures that can reduce hydrofluorocarbon ("HFC") emissions at national and international levels, in addition to State-level action that includes an incentive program to encourage the use of low-Global Warming Potential ("GWP") refrigerants and limitations on the use of high-GWP refrigerants in new refrigeration and air-conditioning equipment (CARB, 2017).

Executive Order B-55-18. In September 2018, EO B-55-18 was enacted and establishes a statewide policy for the state to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. CARB will be responsible for working with relevant state agencies to ensure that future scoping plans identify and recommend measures to achieve the carbon neutrality goal.

Senate Bill 100. In 2018, SB 100 increased the standards set forth by SB 350 establishing that 44 percent of the total electricity sold to retail customers in California per year by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030 be secured from qualifying renewable energy sources. Additionally, this bill states that it is the policy of the State that eligible renewable energy resources and zero-carbon resources supply 100 percent of the retail sales of electricity to California, and that to achieve that goal, carbon emissions not be increase elsewhere in the western grid or through resource shuffling.

4.7.3.3 Local

Monterey County 1982 General Plan. The County of Monterey General Plan does not include policies related to greenhouse gas emissions.

North County Area Plan. The North County Area Plan ("NCAP"), one of Monterey County's area plans, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The NCAP does not include policies related to greenhouse gas emissions.

4.7.4 IMPACTS AND MITIGATION MEASURES

4.7.4.1 Thresholds of Significance

A project impact would be considered significant if the project would:

a. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or,

b. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

4.7.4.2 Methodology

Short-term Construction. Ambient Air Quality & Noise Consulting, Inc ("Ambient") quantified the short-term emissions using the California Emissions Estimator Model ("CalEEMod"), version 2016.3.2. Ambient assumed that Proposed Project's construction could potentially occur in two (2) phases. However, to ensure a conservative analysis, Ambient assumed that construction of the Proposed Project would occur over a one-year period. Emissions modeling included the demolition of an estimate 6,500 square feet of existing structures and 11,100 cubic yards of imported soil. As discussed in Section **4.2 Air Quality**, the Applicant provided updated grading plans that identified 9,200 cubic yards of cut and 6,410 cubic yards of fill for proposed residences, construction of an access road, and other infrastructure. An additional 1,200 cubic yards may be required for the improvements to the external access road. An updated CalEEMod analysis (version 2022.1.1.28) was prepared utilizing the same modeling assumptions as Ambient's analysis Ambient's modeling assumptions include off-road equipment usage, worker and vendor vehicle trips, trips distances and fleet mix were based largely on model defaults for Monterey County. Ambient amortized the construction-generated GHGs over an estimated 30-year project life and included operational emissions for determining the impact significance. A copy of Ambient's analysis is included in **Appendix B**.

Long-term Operation. Ambient quantified long-term emissions using CalEEMod, version 2016.3.2, assuming a total of 19 single-family residential dwelling units[1]. Ambient derived vehicle trip-generation rates from the traffic analysis prepared for this Project. Ambient adjusted energy intensity factors to reflect compliance with Renewable Portfolio Standards requirements. Ambient also assumed the proposed residential dwellings would include installation of solar photovoltaic systems, low-flow water fixtures, water-efficient irrigation systems, energy-efficient lighting, and appliances, in compliance with current and anticipated construction year building code requirements. At a minimum, solar P.V. systems would provide 20 percent of the estimated electrical demand. Other modeling assumptions, including energy and water usage rates, waste-generation rates, vehicle trip distances, and vehicle fleet mix were based on CalEEMod model defaults for Monterey County. Ambient assumed a 2020 build-out and therefore, emissions post-2020 would be reduced as a result of reduced future-year energy usage and vehicle emission factors. Based on revised grading quantities, an updated CalEEMod analysis was prepared and assumed a 2026 build-out. Consistent with Ambient's analysis, emissions post-2026 would continue to be reduced as a result of reduced future energy usage and vehicle emission factors. Refer to **Appendix B** for more information.

[1] The CalEEMod modeling is conservative as it models emissions from the construction and operation of 19 single-family residential dwelling units. The model does not account for the three existing residences on-site.

4.7.4.3 Impact Analysis

Impact GHG-1: The Proposed Project would generate temporary GHG emissions in connection with construction-related activities. In addition, the Proposed Project would also generate operational GHG emissions. GHG emissions associated with the Proposed Project would not, however, either directly or indirectly, have a significant impact on the environment. Moreover, the Proposed Project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases. This represents a less than significant impact. No mitigation measures are warranted. (Criteria a and b).

The Proposed Project would generate temporary GHG emissions in connection with construction-related activities, as well as operational GHG emissions. MBARD has not yet adopted a threshold for construction-related GHG emissions but recommends utilizing thresholds set by neighboring districts (e.g., Sacramento Metropolitan Air Quality Management District ["SMAQMD"]). SMAQMD adopted an updated threshold based on the 2030 target year in April 2020. Based on correspondence with MBARD staff, utilizing this threshold would be appropriate. Therefore, the Proposed Project would result in a significant GHG related impact if the Proposed Project would emit more than 1,100 metric tons of CO_2e ("$MTCO_2e$") per year (SMAQMD, 2020). Conversely, if a project emits less than 1,100 $MTCO_2e$, the project would have a less than significant GHG related impact.). In order to estimate anticipated GHG emissions associated with the Proposed Project, Ambient combined the estimated GHG emissions generated by construction, amortized over a 30-year period, with the estimated annual GHG emissions resulting from operation of the Project. As discussed below, the Proposed Project would not result in a significant GHG related impact.

Construction

Construction of the Proposed Project would not generate greenhouse gas emissions, either directly or indirectly, that would have a significant impact on the environment. Construction-generated GHG emissions are summarized in **Table 4.7-3.** Project construction would generate a total of approximately 463 $MTCO_2e$. When amortized over a 30-year life of the Project, GHG emissions would total approximately 15.4 $MTCO_2e$/year. There would also be a small amount of GHG emissions from waste generated during construction; however, this amount is speculative. Construction-generated emissions would vary, depending on the final construction schedules, equipment required, and activities conducted. Construction-generated emissions were included with operational emissions to determine the significance of the Project's potential GHG effects.

Table 4.7-3
Construction Emissions of GHGs

Construction Phase	Annual Emissions ($MTCO_2e$/Year)
Demolition (2025)	34.7
Site Preparation (2025)	24.2
Grading (2025)	91.5
Building Construction (2025/2026)	296.7
Architectural Coating (2026)	1.3
Paving (2026)	14.7
Total Construction Emissions:	463
Amortized Net Change in Construction Emissions[1]:	15.4

Source: CalEEMod 2024, Ambient Air Quality & Noise Consulting. 2018, and Denise Duffy & Associates, Inc. 2024 CalEEMod Update.

1. Amortized emissions are quantified based on an estimated 30-year project life.
2. Refer to Appendix B for emissions modeling assumptions and results.

Operational

Operational GHG emissions are summarized in **Table 4.7-4**. With the inclusion of amortized construction-generated emissions, the buildout of the Proposed Project would generate a total of approximately 396.6 $MTCO_2e$/year. Mobile sources are projected to account for roughly 77-78 percent of the total operational GHG emissions at buildout. Approximately 12-13 percent of the project's total operational GHGs would be associated with energy use, and the remaining emissions would be associated with area sources, water use, and waste generation. Project-generated GHG emissions are projected to decrease in future years due largely to improvements in energy-efficiency and vehicle fleet emissions.

Table 4.7-4
Operational Emissions of GHGs – Year 2025

Source	Annual Emissions ($MTCO_2e$/Year)	Percent Contribution
Area	29.8	7.8 %
Energy Use	48.6	12.8%
Mobile	296	77.6%
Waste	5.7	1.5%
Water	1.1	0.3%
Total:	381.2	N/A
Total with Amortized Construction Emissions:[2]	396.6	N/A
Significance Threshold:	1,100	N/A
Exceeds Significance Threshold?:	No	N/A

Source: Ambient Air Quality & Noise Consulting. 2018

1. GHG emissions quantified for buildout conditions.
2. Refer to Appendix B for emissions modeling assumptions and results.

Conclusion

As noted in **Table 4.7-4**, annual GHG emissions would not exceed the significance threshold of 1,100 $MTCO_2e$/year. As a result, the Proposed Project would not result in GHG emissions that would have a significant impact on the environment, nor would the Proposed Project conflict with applicable GHG-reduction plans, policies, or regulations. While the Proposed Project would not exceed the significance threshold of 1,100 $MTCO_2e$/year, it is recommended that the Proposed Project not include natural gas connections and that the Proposed Project comply with CalGreen Tier 2 standards for the installation of electric

vehicle charging stations. **This impact would be considered less than significant. No mitigation measures are necessary.**

Significance: Less than Significant

Mitigation: None

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4.8 HAZARDS AND HAZARDOUS MATERIALS

4.8.1 INTRODUCTION

This section analyzes the potential existence of hazardous materials at the Project site and possible impacts involving the use, transport, or storage of hazardous materials. This section: 1) describes the existing environmental setting, 2) identifies the regulatory environment, including relevant state and local requirements, and 3) evaluates the Proposed Project's potential adverse environmental effects and identifies the mitigation measures to reduce those effects, as necessary. Potential impacts related to flooding, groundwater quality, seismic/geologic, and public service hazards, such as fire and emergency response, are discussed in **Section 4.9, Hydrology and Water Quality**, **Section 4.6, Geology and Soils**, and **Section 4.12 Public Services**, respectively. **Table 4.8-1** summarizes the anticipated environmental effects of the Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.8.4 Impacts and Mitigation Measures**.

Table 4.8-1
Summary of Hazards and Hazardous Materials Environmental Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measures	Residual Impacts
HZ-1	The Proposed Project would require the use of potentially hazardous materials during construction. The temporary use of hazardous materials during construction would be short-term in nature and would be addressed through the implementation of standard construction-phase Best Management Practices. As a result, 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.	None	Less than Significant.
HZ-2	The Project could create a significant hazard to the public or the environment through the reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The Project site has historically been used for agricultural purposes, which could expose site occupants to residual hazards due to pesticide use. In addition, the Project also involves the demolition of existing on-site structures that could include lead-based paint and asbestos containing material. As a result, the Proposed Project could expose site occupants, including future residents and/or construction personnel, to a health risk.	Potentially significant impact.	HZ-2a HZ-2b	Less than Significant.
HZ-3	The Proposed Project is not adjacent to wildlands, which are defined as areas in which development is essentially non-existent, and typically has great environmental importance. The Project site is however, in an area subject to high fire hazards. As a result, future site occupants could be exposed to potential fire related hazards. The Proposed Project would be required to comply with Monterey County Code 18.09. Fire Code and Monterey County Code 18.56. Wildfire Protection Standards in State Responsibility Areas, which would ensure that potential fire related hazards are minimized.	Less than Significant.	None	Less than Significant.

4.8.2 ENVIRONMENTAL SETTING

4.8.2.1 Project Site

The Project area consists mainly of rolling hills supporting some grazing and rural residential development. Vegetation in the area includes a combination of oak woodland, coast range grassland, and maritime chaparral. Rural residential uses surround the Project site, and no current commercial agricultural uses exist within the immediate Project vicinity. Historically, the eastern portion of the Project site contained a small goat dairy, and this area also supported limited agricultural uses. The site is currently used for a variety of small-scale agricultural purposes. Existing development on the Project site includes three (3) single-family residences, water tanks, and supporting structures and infrastructure. Currently, an existing well on proposed lot 19 provides domestic water to the existing residences. This well would be abandoned as part of the Proposed Project.

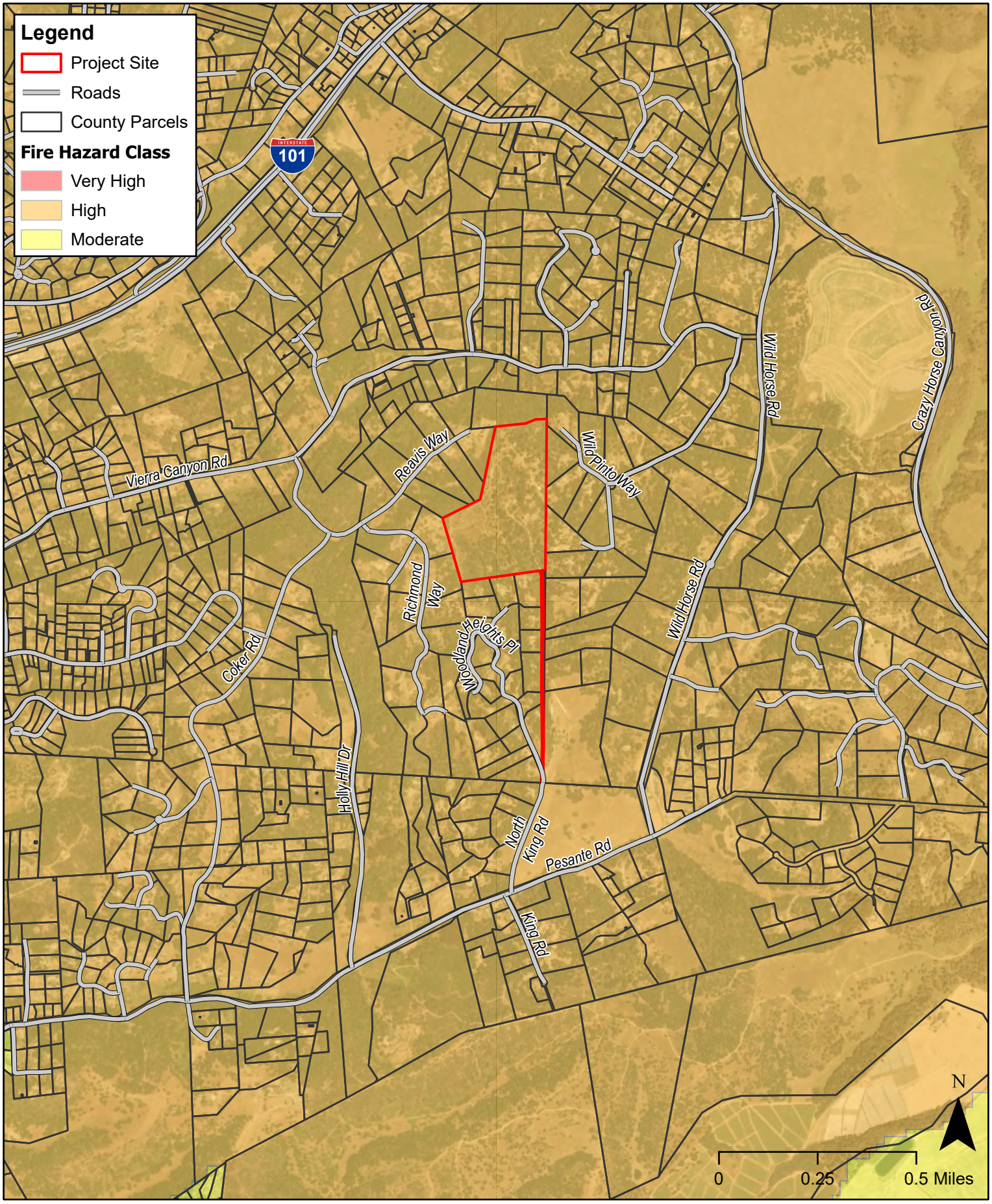
The State of California uses databases such as EnviroStor, State Water Resources Control Board ("SWRCB") GeoTracker ("GeoTracker"), and Cortese to map the location of hazardous waste sites. Hazardous waste sites include those that have been remediated, sites currently undergoing remediation, and sites that require cleanup. No hazardous materials contamination has been documented on-site.

4.8.2.2 Surrounding Uses

Surrounding land uses include U.S. 101 to the northwest (approximately two (2) miles) and predominately rural residential use. Crazy Horse Canyon Road and open space is to the east, while commercial agricultural land is to the south. One (1) hazardous materials site, Crazy Horse Sanitary Landfill ("Landfill") is located within a 1-mile radius of the Project site. The landfill is located at 350 Crazy Horse Canyon Road in Salinas California, approximately 0.75 miles northeast of the Project site. California EnviroStor database identified a Leaking Underground Storage Tank ("LUST") at the Landfill. Contaminants at the Landfill LUST site include biological waste other than sewage sludge, empty containers, empty pesticide containers, hydrocarbon solvents, and other pesticide containers. According to the SWRCB GeoTracker, the Landfill site is "Open-Closing with Monitoring as of March 2014". As such, this indicates that the remediation is essentially complete and monitoring/sampling will occur to confirm a successful cleanup of the site (GeoTracker, 2021).

4.8.2.3 Wildland Fire Hazards

The California Department of Forestry and Fire Protection ("CalFire") is required to map fire hazards within State Responsibility Areas ("SRAs") based on factors such as fuels, terrain, and weather (Public Resources Code Sec. 4201 – 4204). CalFire defines potential fire hazards based on their potential for causing ignitions to buildings. These areas as referred to as "Fire Hazard Severity Zones" ("FHSZ"). CalFire designates areas as "moderate," "high," or "very high" for areas within SRAs. The Project is located within an SRA and CalFire is responsible for providing wildland fire suppression services to the area. The Project site is also within the service area for the North County Fire Protection District. The Project site is classified as a "High" fire hazard area according to CalFire. (**Figure 4.8-1**) This fire hazard rating is based on slope, climate, fuel loading (e.g., vegetation), and availability of water. It is important to note that these categories are for wildland fire hazards only; they do not consider structural, property, or population hazards.



Fire Hazard Map	Date 7/1/2022	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 4.8-1
	Scale 1:20,000		

4.8.2.4 Airport Hazards

There are two (2) airports in the vicinity of the Project: the Salinas Municipal Airport, located approximately nine (9) miles south of the Project site, and the Monterey Regional Airport, located approximately 19 miles southwest of the Project site. The Project site is not located in an area subject to potential airport hazards.

4.8.3 REGULATORY ENVIRONMENT

4.8.3.1 Definition of Hazardous Materials

Hazardous materials, as defined in Title 22 of the California Code of Regulations ("CCR"), are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed (CCR, Title 22, Section 66260.10). Hazardous waste is any hazardous material that is discarded, abandoned, or slated to be recycled. If improperly handled, hazardous materials and waste can result in public health hazards when released into the soil or groundwater or through airborne releases in vapors, fumes, or dust. Soil and groundwater having concentrations of hazardous constituents higher than specific regulatory levels must be handled and disposed of as hazardous waste when excavated or pumped from an aquifer. The generation, storage, and handling of hazardous materials and wastes are regulated by various federal, state, and local laws and regulations aimed at the protection of public health and the environment. A summary of regulations follows.

4.8.3.2 Federal

Toxic Substances Control Act. Congress enacted the Toxic Substances Control Act ("TSCA") in 1976, to become effective January 1, 1977. The act authorizes the U.S. Environmental Protection Agency ("EPA") to secure information on all new and existing chemical substances and to control any of these substances determined to cause an unreasonable risk to public health or the environment. The TSCA also includes requirements for the storage, use, and disposal of PCB-containing materials.

Resource Conservation and Recovery Act. The Resource Conservation and Recovery Act ("RCRA") enables the EPA to administer a regulatory program that extends from the manufacture of hazardous materials to their disposal, thus regulating the generation, transport, treatment, storage, and disposal of hazardous waste at all facilities and sites in the nation.

Comprehensive Environmental Response, Compensation and Liability Act. The Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), more commonly known as Superfund, established the National Priorities List for identifying and obtaining funding for remediation of severely contaminated sites. Federal regulations pertaining to hazardous materials and waste are contained in the Code of Federal Regulations ("40 CFR"). The regulations contain specific guidelines for determining whether a waste is hazardous based on either the source of generation or the characteristics of the waste.

Government Code 51175-89. Government Code 51175-89 directs CAL FIRE to identify areas of significant fire hazard severity zones within LRAs. Mapping of the areas, referred to VHFHSZ, is based on fuels, terrain, weather, and other relevant factors. These zones are used to define areas which may contain wildfire hazards and may need further measures to reduce the risk associated with wildland fires.

4.8.3.3 State

The EPA has delegated much of its regulatory authority to individual states whenever adequate state regulatory programs exist. The Department of Toxic Substance Control Division ("DTSC") of the California Environmental Protection Agency ("CALEPA") is the agency empowered to enforce federal hazardous materials and waste regulations in California, in conjunction with the EPA.

Hazardous Waste Control Act. The Hazardous Waste Control Act of 1972 created the state hazardous waste management program similar to, but more stringent than, the federal RCRA. The act is implemented by regulations contained in the California Code of Regulations, Titles 22 and 26. Regulations implementing the California Hazardous Waste Control Act list hazardous chemicals; establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe management of hazardous wastes; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous wastes that cannot be disposed of in landfills.

These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of them. Under Title 26 and the California Hazardous Waste Control Act, hazardous waste manifests must be retained by the hazardous waste generator for a minimum of three years. A hazardous waste manifest lists a description of the waste, its intended destination, and regulatory information about the waste. A copy of each manifest must be filed with DTSC. The generator must match copies of hazardous waste manifests with receipts from the treatment/disposal/recycling facility to confirm that the wastes were properly handled.

Hazardous Materials Release Response Plans and Inventory Act. The Hazardous Materials Release Response Plans and Inventory Act of 1985, also known as the Business Plan Act, requires the preparation of hazardous materials business plans and disclosure of hazardous materials inventories. The hazardous materials business plan includes a description of facilities, inventories, emergency response plans, and employee safety and emergency response training programs (California Health and Safety Code, Division 20, Chapter 6.95, Article 1). Hazardous materials are not considered hazardous waste and are defined as raw or unused materials that are part of a process or manufacturing step. However, health concerns pertaining to the release of hazardous materials are similar to those relating to hazardous waste.

California Water Code. California Water Code Section 231 requires the California Department of Water Resources ("DWR") to develop well standards to protect California's groundwater quality. Standards for wells in California are found in DWR Bulletins No. 74-81 and 74-90, entitled Water Well Standards, State of California. The standards apply to all water well drillers in California and the local agencies that enforce them.

California Emergency Services Act. Under the California Emergency Services Act, the state developed an Emergency Response Plan to coordinate emergency services provided by federal, state, and local agencies. Responding to hazardous materials incidents is one part of this plan. The Emergency Response Plan is administered by the California Office of Emergency Services ("Cal EMS"), which coordinates the responses of other agencies. The County of Monterey Environmental Health Department's Emergency Response Team provides the capabilities for hazardous materials emergencies within the project area. Emergency Response Team members respond and work with local fire and police agencies, California Highway Patrol, California Department of Fish and Wildlife, California Department of Transportation, U.S. Coast Guard, and National Marine Sanctuary personnel.

Public Resources Code Section 4201-4204. Sections 4201 through 4204 of the California Public Resources Code direct Cal Fire to map FHSZs within SRAs, based on relevant factors such as fuels, terrain, and weather. Mitigation strategies and building code requirements to reduce wildland fire risks to buildings within SRAs are based on these zone designations.

Government Code Section 51175-51189. Sections 51175 through 51189 of the California Government Code directs Cal Fire to recommend FHSZs within LRAs. Local agencies are required to designate VHFHSZs in their jurisdiction within 120 days of receiving recommendations from Cal Fire, and may include additional areas not identified by Cal Fire as VHFHSZs.

California Fire Code. The 2022 California Fire Code Chapter 49 establishes the requirements for development within wildland-urban interface areas, including regulations for wildfire protection building construction, hazardous vegetation and fuel management, and defensible space maintained around buildings and structures.

In 2021, the California Board of Forestry re-adopted the State Minimum Fire Safe Regulations. These regulations were prepared to establish the minimum wildfire protection standards in conjunction with construction of buildings in the SRA's and in the Very High Fire Hazard Severity Zone ("VHFHSZ"). Building construction within these zones are required to provide the minimum wildfire protection standards specified in the articles of 14 CCR Section 1270.

Uniform Fire Code. The Uniform Fire Code, Article 80 (Section 80.103 of the Uniform Fire Code as adopted by the State Fire Marshal pursuant to Health and Safety Code Section 13143.9), includes specific requirements for the safe storage and handling of hazardous materials. These requirements are intended to reduce the potential for a release of hazardous materials and for mixing of incompatible chemicals, and specify the following specific design features to reduce the potential for a release of hazardous materials that could affect public health or the environment:

- Separation of incompatible materials with a noncombustible partition;
- Spill control in all storage, handling, and dispensing areas; and
- Separate secondary containment for each chemical storage system. The secondary containment must hold the entire contents of the tank, plus the volume of water needed to supply the fire suppression system for a period of 20 minutes in the event of catastrophic spill.

4.8.3.4 Local

Monterey County 1982 General Plan. The County of Monterey General Plan provides policies to prevent hazardous materials related impacts. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing,** for a detailed analysis of the Project's consistency with the County's hazardous materials policies. Relevant policies are listed below:

17.3.1 In no case shall a roadway be less than 12 feet wide. Determination of the width of an all-weather surface shall be made at the time of subdivision approval. Further, the County shall revise its subdivision ordinance to address road standards including minimum width, height clearance, gradient, and materials; these standards shall pertain to all new development. Minimum road widths of all new driveways, roads and streets shall be designed, constructed, and maintained according to adopted County Standards (Appendix D: Standard Detail, 1977).

17.3.3 The County shall encourage all new development to be located within the response time of 15 minutes from the fire station responsible for serving the parcel. If this is not possible, on-site fire protection systems (such as fire breaks, fire-retardant building materials, and/or water storage tanks) approved by the fire jurisdiction must be installed or development may only take place at the lowest density allowed for the parcel by the General Plan.

17.3.4 The County shall require all new development to have adequate water available for fire suppression. Water availability can be provided from a conventional water system; from an approved alternative water system if within 300 feet of a habitable structure; by the fire fighting equipment of the fire district within which the property is located; or by an individual water storage facility-water tank, swimming pool, etc.--on the property itself. The fire and planning departments shall determine the adequacy and location of individual water storage to be provided.

17.4.1 All residential, commercial, and industrial structural development (not including accessory uses) in high and very high fire hazard areas shall incorporate recommendations by the local fire district before a building permit can be issued.

17.4.2 Every building, structure and/or development shall be constructed to meet, at minimum, the requirements specified in Volume I of the current edition of the Uniform Building Code, Fire Hazards Policy 17.3.5, and Table 2 of this general plan. The chief of the fire agency having jurisdiction may recommend to the appropriate decision-making authority a variation of the general plan fire hazard policies and Table 2 (but not U.B.C. standards) for such development where, in his opinion, the fire safety of the County and adjoining and nearby properties and improvements is not materially impaired by such variation.

17.4.4 House numbers shall be posted on the property so as to be clearly visible from the road. Where visibility cannot be provided, a post or sign bearing the house numbers shall be set adjacent to the driveway or access road to the property. House numbers shall be posted when construction begins.

17.4.7 The County shall require all subdivisions, multi-unit residential complexes, and commercial and industrial complexes to obtain, prior to permit approval, a statement from the fire department that adequate structural fire protection is available within minimum response time established by this Plan.

17.4.12 A zone which can inhibit the spread of wildland fire shall be required of new development in fire hazard areas to protect development. Such zones should consider irrigated greenbelts, streets, and fuel modification zones in addition to other suitable methods that may be used. The County should not accept dedications of any open space lands required as part of this fire prevention zone.

18.1.1 The County shall establish land use controls to reduce undesirable effects of hazardous chemicals.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The NCAP provides policies for the protection of people from hazards and hazardous materials characteristic of the area. Please refer to **Table 4.10-5** in **Section 4.10, Land Use, Population, and Housing,** for a detailed analysis of the Project's consistency with the North County Area Plan's hazardous materials policies. Relevant policies are listed below:

17.3.1.1 (NC) All private driveways within newly created lots shall allow all-weather access by the local fire department' largest and heaviest vehicles. All height clearances and turns on these driveways must accommodate these vehicles.

17.3.1.2 (NC) In high and very high wildland fire hazard areas roof construction of fire retardant materials shall be required as approved by the fire protection district. For roof replacement and new wall construction, the use of fire resistant materials is recommended but not required.

17.3.1.3 (NC) The North County Fire Hazards Map shall be used to identify areas of high and fire hazard as addressed by policies in the General Plan.

17.3.1.4 (NC) Dead-end access roads in excess of 150 feet shall satisfy the Fire Department's needs for turning around fire-fighting apparatus.

17.3.1.5 (NC) Alternate routes of escape that will safely handle evacuations and emergency equipment should be established. In areas of high and very high wildland fire hazard as designated by the California Department of Forestry, no private dead-end road or cul-de-sac should be over 1,000 feet in length. In cases where the development is to be served by a dead-end road over 1,000 feet in length, the County Planning Department staff shall meet with a representative of the local fire protection agency and the developer to formulate a plan for provision of a secondary access. Such a plan for secondary access shall be implemented by the developer during pending and/or subsequent phases of development. If secondary access cannot be developed or if, in the case of individual lots of record the requirement for secondary access would place an unfair economic burden on the property owner, other alternatives to mitigate safety concerns should be considered.

17.4.14 (NC) New residential structures shall be required to have smoke detectors installed in approved locations. New residential structures with chimneys shall be required to have approved spark-arresting screens or devices. These fire safety devices shall also be required of all residential structures being resold.

Monterey County Code. Chapter 18.56 of the Monterey County Code adopts Sections 4290 et seq. of the Public Resources Code, which requires incorporating wildfire protection standards in conjunction with building, construction, and development in designated State Responsibility Areas ("SRAs"). SRAs are under the direct fire protection authority of the California Department of Forestry and Fire Protection. These standards provide that future design and construction of structures, subdivisions, and developments must provide for emergency access and perimeter wildfire protection measures. Specifically, Section 4291(a) of the

PRC requires a minimum 100 feet of defensible space around all residential, commercial, and industrial buildings within SRAs approved after January 1, 1991. Additionally, Section 4291(a) requires removal of trees that extend within ten (10) feet of chimneys or stovepipes, removal of dead or dying wood adjacent to or overhanding a building, maintaining clean roofing (i.e., removing leaves, needles or other vegetative materials from roofs), and that prior to construction of a new building or structure, or rebuilding a building or structure damaged by fire a certificate is obtain by a local building official that the dwelling structures comply with building standards including those described in Section 51189 of the California Government Code.

Section 4117 of the Public Resources Code and the regulations promulgated by the California Department of Forestry and Fire Protection provide that local agencies, such as the County of Monterey, may adopt ordinances, rules, or regulations to provide fire prevention restrictions or regulations that are necessary to meet local conditions of weather, vegetation, or other fire hazards. These ordinances, rules, or regulations may be more restrictive than state statutes in order to meet local fire conditions.

4.8.4 IMPACTS AND MITIGATION MEASURES

4.8.4.1 Thresholds of Significance

A project impact would be considered significant if the Project would:

a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

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;

c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

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;

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;

f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or,

g. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

4.8.4.2 Area of No Impact

Some of the significance criteria outlined above (c, d, e, and f) are not applicable to the Proposed Project, or the Proposed Project would not result in impacts related to these criteria, as explained below. The impact analyses related to the other criteria (a, b, and g) are addressed below under **Section 4.8.4.3 Impact Analysis.**

c. *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.* The Proposed Project consists of a residential subdivision – there are no commercial or industrial uses associated with the Proposed Project that would result in the emission or handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school. The Proposed Project would result in the temporary use and handling of potentially hazardous materials during construction (and demolition) of the Proposed Project. The hauling of construction debris would occur within 0.05 miles of Prunedale Elementary; however, these effects would be limited in duration and would not result in any additional hazards beyond those associated with existing vehicle use along the roadway. Additionally, construction related activities occurring on the Project site would not be within a quarter mile of a school. Therefore, construction and demolition activities 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. The nearest existing or proposed school is approximately 1.75 miles from the Project site. Therefore, there would be no impact from the Proposed Project.

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.* The Project site is not located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, the Project would not create a significant hazard to the public or the environment.

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.* The Project is not located within an airport land use plan and is not located in the vicinity of a private airstrip. The nearest airport is located nine (9) miles from the site. Due to its distance from the airports, the Proposed Project would not be subject to any potential airport related hazards. The Project Site is not within any of the designated airport zones or the Community Noise Equivalent Level ("CNEL") contour zone. Therefore, the Proposed Project would not result in a safety hazard or excessive noise for people residing or working in the project area.

f. *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.* The Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The 2020 Monterey County Emergency Operations Plan and 2022 County of Monterey Evacuation and Transportation Plan is an update to the 2010 plan, and includes the Project area (i.e., unincorporated Monterey County). As discussed in **Section 4.12, Public Services,** the Proposed Project would increase the demand for public services (i.e., police and fire protection services) due to the introduction of new residential uses on the site. However, the Proposed Project would not impair the implementation or physically interfere with an adopted emergency response plan. Moreover, as described in **Section 4.12, Public Service,** the Proposed Project would adequately be accommodated by existing service providers and would not impact service ratios, response times, or other performance objectives. The closest emergency evacuation route is U.S. 101 (Monterey County, 2021), located approximately 1.75 miles west of the Project site ingress or egress of U.S. 101.

4.8.4.3 Impact Analysis

Impact HZ-1: The Proposed Project would require the use of potentially hazardous materials during construction. The temporary use of hazardous materials during construction would be short-term in nature and would be addressed through the implementation of standard construction-phase Best Management Practices. As a result, 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. This represents a less than significant impact. No mitigation measures are warranted. (Criterion a).

The Proposed Project would result in temporary construction related hazardous material use and minor use of hazardous materials during operation. The following evaluates the potential construction and operational impacts associated with the Proposed Project. As discussed below, the Proposed Project would have a less than significant impact; no mitigation measures are warranted.

Construction

Construction of the Project would not create a significant impact due to routine transport, use, or disposal of hazardous materials. However, construction activities would require the temporary use of hazardous substances, such as fuel for construction equipment, oil, solvents, paints, etc. The types and amounts of hazardous materials used during construction activities would vary according to the type of activity. An appropriately licensed contractor would coordinate and conduct the removal and disposal of hazardous materials from the Project site. Any handling, transporting, use, or disposal would comply with applicable laws, regulations, policies, and programs set forth by various federal, state, and local agencies. Moreover, runoff and erosion control measures, as well as standard construction Best Management Practices ("BMPs") would be implemented during construction to minimize potential impacts due to contaminated runoff. Additionally, a spill prevention plan would be developed prior to construction to address any accidental spills. Compliance with existing federal, state, and local laws and regulations governing the use, storage, transportation, and disposal of hazardous materials during construction activities would ensure that the Proposed Project would not cause a significant hazard to the environment through the release of hazardous materials. Moreover, these impacts would be temporary in nature**.** As a result, the Project is not anticipated to cause a significant hazard to the environment through the release of hazardous materials during construction. **This represents a less than significant impact. No mitigation measures are necessary.**

Operation

Following construction, the Proposed Project could entail the minor use of hazardous materials for the regular maintenance of residential areas, landscaping, and other similar applications as part of on-going residential use of the site. Hazardous materials used during the operation of the Proposed Project may include, but are not limited to, solvents, fertilizers, and pesticides. However, the use of these materials as part of residential use of the site would not constitute the routine transport, use, or storage of a hazardous material such that it would constitute a significant public hazard. The use of common household products represents a low risk to people and the environment when used as intended. Furthermore, use of these materials as part of on-going maintenance is typical for a residential subdivision. **Therefore, this represents a less than significant impact. No mitigation measures are necessary.**

Conclusion

Hazardous materials would be used during construction and operation of the Proposed Project, however, use would either be temporary in nature or be limited to household products for which use, transport, storage would not constitute a significant public hazard. Construction of the Proposed Project would require temporary use of hazardous materials. Additionally, use of hazardous materials during construction of the Proposed Project would be required to comply with federal, state, and local laws and regulations. **Therefore, this represents a less than significant impact. No mitigation measures are necessary.**

Significance: Less than Significant

Mitigation: None

Impact HZ-2: The Project could create a significant hazard to the public or the environment through the reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The Project site has historically been used for agricultural purposes, which could expose site occupants to residual hazards due to pesticide use. In addition, the Project also involves the demolition of existing on-site structures that could include lead-based paint and asbestos containing material. As a result, the Proposed Project could expose site occupants, including future residents and/or construction personnel, to a health risk. This is a potentially significant impact that could be reduced to a less than significant level with the following mitigation measures. (Criterion b).

The Proposed Project could create a potential hazard to the public or the environment due to the site's historic use, as well as the demolition of existing on-site structures. As discussed below, the Project could expose site occupants to potential hazards associated with the historic use of the property for agricultural purposes. In addition, the demolition of on-site structures could also expose site occupants to potential hazards associated with lead-based paint and asbestos-containing material. This represents a potentially significant impact that can be reduced to a less-than-significant level with mitigation.

Agricultural Use

The Project site is predominantly undeveloped and surrounded by residential uses. Prior use of a portion of the Project site included a goat dairy and limited agricultural production. The site has not been used extensively for agricultural purposes since at least the mid-1990s, although some limited agricultural use is on-going. No hazardous materials were associated with the goat dairy operation, although it is unknown whether pesticide use occurred on-site. As a result, there is the potential that residual pesticide contamination could exist on-site. Although remote, residual agricultural hazards could expose future site occupants to potential health hazards due to residual pesticide contamination. **This is considered a potentially significant effect that could be reduced to a less than significant impact through the implementation of the mitigation measure HZ-2a identified below.**

Asbestos Containing Material and Lead-Based Paint

The Proposed Project involves the demolition of existing structures of varying age and construction. The demolition of existing structures could result in the accidental release of hazardous materials into the

environment which could expose site occupants (i.e., residents or construction personnel) to residual hazards. Due to the unknown age of on-site structures, it is possible that they could contain lead-based paint or asbestos containing material. The demolition of these structures could expose people to hazardous emissions that are known to cause human health risks. To minimize potential adverse effects associated with the demolition of existing structures, MBARD Rule 424 requires an asbestos survey of existing structures prior to demolition. If asbestos-containing material is identified, Rule 424 requires that the asbestos hazard is abated. Compliance with MBARD Rule 424 will ensure that potential asbestos related hazards are reduced to a less-than-significant level. To ensure that potential lead-based paint hazards due to the demolition of on-site structures is minimized to a less-than-significant level, mitigation is, however, warranted. **The implementation of the mitigation measures identified below would ensure that potential hazards due to the demolition of on-site structures would be reduced to a less than significant level.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure HZ-2a:

Prior to the issuance of any grading permit or building permit, the Applicant shall retain a qualified professional to conduct a Phase I Environmental Site Assessment in conformance with ASTM Standard 1527-05 for the portion of land to be graded. The Phase I shall identify potential locations where hazardous material contamination may be encountered on the site in connection with prior agricultural use. Where potential contamination is identified, the Environmental Site Assessment shall include site-specific soil sampling to assess the presence of potential soil contamination (pesticide residues). If an Environmental Site Assessment indicates that residual contamination or a release of hazardous materials could have affected soil or groundwater quality at a project site, a Phase II Environmental Site Assessment shall be conducted to determine the extent of contamination. The Phase II ESA shall identify recommended measures to address residential agricultural contamination, including but not limited to removal of contaminated soils. If the results of the subsurface investigation(s) indicate the presence of hazardous materials, the Applicant shall coordinate with the County of Monterey Environmental Health Bureau to develop and implement a program to remediate or manage the contaminated soil during construction. Disposal shall occur at an appropriate facility licensed to handle such contaminants and remedial excavation shall proceed under the supervision of an environmental consultant licensed to oversee such remediation. If the Phase II ESA determines that remediation is necessary, and more specifically if remediation is necessary in areas identified as biological sensitive as discussed in **Section 4.3 Biological Resources**, than the Applicant shall restore these areas to native habitat. The Applicant shall submit all correspondence and reports to the County of Monterey HCD – Planning and County of Monterey Environmental Health Bureau prior to issuance of grading permits. Upon completion of any required remediation and disposal, a qualified environmental consultant shall prepare and submit to the County for review and approval a report summarizing the remediation efforts, the remediation and disposal approach implemented, and the analytical results after completion of the remediation, including all waste disposal or treatment manifests.

Mitigation Measure HZ-2b:

Prior to demolition of any on-site structure, the Applicant shall submit a lead assessment to the County of Monterey HCD – Planning , County of Monterey Environmental Health Bureau, and MBARD for review and approval. The assessment shall evaluate existing on-site structures for the presence of lead-based paint. If present, all lead-based paint shall be removed by a licensed abatement contractor and the Applicant shall submit a final report detailing that all lead-based paint was removed and properly disposed of in accordance with industry standards, including Title 22 of the California Code of Regulations. Similarly, the Applicant shall also submit an asbestos survey demonstrating that all existing on-site structures were evaluated for the presence of asbestos containing material prior to demolition. If asbestos containing material is present, the Applicant shall submit a final report detailing that all asbestos containing material was disposed of in accordance with industry standard.

Impact HZ-3: The Project site is located in an area subject to high fire hazards. As a result, future site occupants could be exposed to potential fire related hazards. The Proposed Project would, be required to comply with Monterey County Code Chapter 18.09 and Chapter 18.56. Compliance with these codes would ensure that potential project-related effects would be less than significant. No mitigation measures are warranted. (Criterion g).

The Proposed Project could be subject to potential wildfire hazards during the design lifetime of the Project. As identified above, the Proposed Project is in a "High" fire hazard severity zone according to CalFire. This classification represents CalFire's determination of potential fire hazard based on slope, climate, fuel loading/vegetation, and water availability. While the Project is in a semi-rural area that is classified as a "High" fire hazard severity zone, the Project is not adjacent to wildlands or an area characterized as being subject to potential wildland fire hazards. The Project site is surrounded by existing rural residential development and future residential development would be required to comply with the applicable fire safety provisions of the California Building Code (i.e., Chapter 18.09. Fire Code), as well as comply with Chapter 18.56 of the Monterey County Code (Ordinance 3600, 1992). Future residential buildout of the site will be required to include automatic sprinkler systems, noncombustible construction material, extraordinary fuel modification measures, creation of evacuation areas, alternative access routes, and alternative roadway modifications; thereby reducing the risk of damage from fire to the maximum extent practicable. As discussed in Chapter 3.0, Project Description, the Proposed Project includes a secondary access via a 13-foot wide private road connecting into North King Road. As a result, the Proposed Project includes alternative access during an emergency. Compliance with the California Building Code as well as Monterey County Code would ensure that people or structures are not exposed to a significant risk of loss, injury, or death associated with wildland fires. Compliance with California Building Code and Chapter 18.56 of the Monterey County Code would ensure that exposure to wildland fires on the Project site is minimized. Therefore, this would be considered a less than significant impact. No mitigation measures are necessary.

Significance: Less than Significant.

Mitigation: None.

4.8.5 REFERENCES

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County of Monterey, 2020. *County of Monterey Emergency Operations Plan.*

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4.9 HYDROLOGY AND WATER QUALITY

4.9.1 INTRODUCTION

This section evaluates the potential hydrology and water quality impacts associated with the development of the Proposed Project. This section: 1) describes the environmental setting, 2) identifies applicable regulatory requirements, and 3) evaluates the potential environmental effects associated with the Proposed Project and identifies applicable mitigation measures to reduce the extent of impacts to a less than significant level, where necessary. This section reflects Questa Engineering Corporation's ("Questa's") independent analysis of the Proposed Project based on information prepared by the Project Applicant, review of available background literature, and technical input provided by the County of Monterey Environmental Health Bureau. **Table 4.9-1** summarizes the anticipated environmental effects of the Proposed Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.9.4, Impacts and Mitigation Measures**.

Table 4.9-1
Summary of Hydrology & Water Quality Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measures	Residual Impact
HYD-1	The Proposed Project could result in potential water quality effects associated with the construction and operation of the Proposed Project. As a result, the Proposed Project could violate applicable water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.	Potentially Significant	HYD-1	Less than significant
HYD-2	The Proposed Project would substantially alter the existing drainage pattern of the site or area through the addition of impervious surfaces that could substantially increase the rate or amount of surface water runoff in a manner that could result in flooding on- or off-site. Moreover, increases in impervious surfaces could also result in additional sources of runoff that could exceed the capacity of planned stormwater drainage improvements.	Potentially Significant	HYD-2	Less than significant

4.9.2 ENVIRONMENTAL SETTING

4.9.2.1 Topography and Climate

The Project site is on the south-facing slopes of Pesante Creek Canyon. The Project site consist of rolling hills, with slopes ranging from about 10 to 20 percent. Elevations range from 390 feet above mean sea level ("MSL") along the southern edge of the property on Lot 4, to 560 feet above MSL on the north end of the property on Lot 17.

The Project site is in the northern (lower) end of the Salinas River Valley on the southwest-facing foothills of the Gabilan Range. Monterey Bay is approximately seven (7) miles to the west. Regional climate patterns are

influenced by the proximity to the Pacific Ocean, mountain barriers, and inland heating. Regional climate patterns are typical of central coastal California inland valleys, receiving most of its rainfall between October and April. According to Western Regional Climate Center data, the average annual rainfall in the project area is approximately 16.7 inches per year.[1] Average temperatures range from a low of 39 degrees Fahrenheit in the winter to 74 degrees Fahrenheit in the summer.

For the Central Coast Region, which encompasses Monterey County, annual rainfall is expected to increase. Anticipated increases in annual and wet season precipitation are identified in **Table 4.9-2**[2] The projected increases over historical averages range from about 6 to 9 percent under intermediate climate change assumptions and 7 to 18 percent under worst-case greenhouse gas projections.

Table 4.9-2
Projected Future Increases over Historical Mean Precipitation,
Central Coast Hydrologic Region (% increase)

Scenario	Intermediate (RCP 4.5)*	Worst Case (RCP 8.5)*
Mid-21st Century - Annual	6.4	7.4
Mid-21st Century - Wet Season	8.7	9.6
Late-21st Century - Annual	6.2	12.8
Late-21st Century - Wet Season	8.6	18.0

* RCP stands for "representative concentration pathway," which is a greenhouse gas concentration trajectory adopted by the Intergovernmental Panel on Climate Change; RCP-4.5 is considered an intermediate projection; RCP-8.5 is a worst-case projection.

4.9.2.2 Pesante Creek Watershed

The Project site is in the Pesante Creek watershed, which drains an area of approximately 2,300 acres, or 3.6 square miles. The watershed originates approximately 0.75 miles east of the Project site near Bolsa Nueva and flows west towards U.S. 101. Several tributaries feed Pesante Creek. These tributaries flow north and south along either side of Pesante Canyon, ultimately draining west to Merritt Lake and Tembladero Slough. The terrain within the watershed is predominantly hilly, with slopes varying from 10 to above 50 percent. The terrain becomes gentler along the canyon floor and along Pesante Road. Existing land uses within the watershed are primarily open space pasture/woodland and urban, suburban, and rural residential.

Figure 4.6-4 in **Section 4.6 Geology and Soils** shows the primary drainage basins directly associated with stormwater runoff from the Project site as Sub-basin 1 and Sub-basin 2. Stormwater runoff from the 48-acre site generally occurs as sheet flow and concentrated shallow flow and is conveyed to the property's southern edge within these two flat-bottomed drainages. At the downstream and southern end of the site, Sub-basin 1 and Sub-basin 2 drain an area of 18.0 and 55.3 acres, respectively. The existing slopes in the basins range from 10 to 14 percent in Sub-basin 1 and 10 to 19 percent in Sub-basin 2. No defined creeks or stream channels exist on the site. Sub-basin 1 and Sub-basin 2 merge south of the site near Pesante Road.

Sub-Basin 1. Approximately 18 acres of the site drain to Sub-basin 1. There is an existing detention-sedimentation pond at the southern end of Sub-basin 1 on proposed Lot 4. This pond, designed by Tunstall

[1] Rainfall estimated based on historical averages for Salinas (14.6") and Chittenden Pass (18.9") rainfall stations, which are equidistant from the project site.
[2] According to "California's Fourth Climate Change Assessment" (State of California, 2018), rainfall is expected to increase in the project area in the 21st century.

Engineering, was built in 2000 as a sedimentation pond to mitigate drainage impacts from the Project site on the adjacent Woodland Heights Subdivision, which is immediately south of the Project site. The detention pond has a total surface area of approximately 20,000 square feet and a detention capacity of approximately 4,500 cubic feet. The pond has a 24-inch diameter slotted vertical riser pipe, trash rack, and a grouted rock spillway to accommodate large storm events.

Sub-Basin 2. Approximately 30.4 acres of the project site plus an estimated 24.9 acres of adjacent open space lands drain to Sub-basin 2. Sub-basin 2 drains through a broad swale along the southeast side of the property on proposed Lots 16 and 19. Runoff collects in a 36-inch reinforced concrete pipe ("RCP") located near the property line, discharging to adjacent lands to the south, where it then flows into an existing agricultural pond located downslope of the site.

4.9.2.3 Existing Site Runoff

Questa calculated the existing peak stormwater discharge from Sub-basin 1 and Sub-basin 2 at the downstream end of the Project site using the Rational Method. The peak discharge is a function of precipitation, topography, soil types, and land use within the drainage basins. The estimated pre-development peak runoff flows for the two (2) sub-basins are provided in **Table 4.9-3**.

Table 4.9-3
Pre-Development Peak Storm Discharges

Sub-basin	Area (acres)	Estimated Pre-development Peak Discharge* Q_2	Estimated Pre-development Peak Discharge* Q_{10}	Estimated Pre-development Peak Discharge* Q_{100}
Sub-Basin 1	18.0	3.4	4.9	10.2
Sub-Basin 2	55.3	10.0	14.7	30.1

* in cubic feet per second
Q 2 = estimated 2-year peak flow
Q 10 = estimated 10-year peak flow
Q 100 = estimated 100-year peak flow
Source: Questa Engineering Corporation, March 2007

4.9.2.4 Geology and Site Soils

The permeability and texture of on-site soils influence drainage patterns at a project site. Soil permeability is the rate at which water is absorbed under saturated conditions and is related to the hydraulic conductivity of the soil. Infiltration is the process where surface water enters the ground and moves downward through the unsaturated soil zone.

Haro, Kasunich, and Associates described the characteristics of subsurface conditions at the Project site in the Preliminary Geologic and Geotechnical Report prepared for the Proposed Project (Haro, Kasunich and Associates, Inc., 2004). See **Appendix I** for more information**.** The Project site is underlain by eolian deposits of the Aromas Sand, with fingers of surficial colluvial deposits filling the two flat-bottomed drainages. The eolian deposits have fine to medium-grained, well-sorted sand containing varying amounts of silt and clay. The colluvium filling the drainage swales has very loose to loose, well-sorted fine to medium-grained sand containing varying amounts of silt. (Ibid.)

The United States Department of Agriculture ("USDA") Natural Resources Conservation Service ("NRCS") describes the site soils as consisting of soil representative of the Arnold Loamy Sand and Arnold-Santa Ynez Complex (see **Figure 4.6-2** in **Section 4.6 Geology and Soils)**. Arnold Loamy Sand is mapped over Sub-basin 1 and Sub-basin 2; the ridges that form the drainage boundaries at the site are mapped as Arnold-Santa Ynez complex. The Arnold soil series consists of somewhat excessively drained soils formed on hills and uplands in old marine sand dunes or in materials weathered from soft sandstone. Arnold soils generally have rapid permeability, medium runoff, and a moderate risk of erosion. The USDA has classified site soils as belonging to Hydrologic Soil Group B. Group B soils are soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well drained sandy loam soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission and are generally suitable for stormwater infiltration (USDA, 1978).

4.9.2.5 Flooding

The Project site is not within a 100-year flood hazard zone as defined by the Federal Emergency Management Agency ("FEMA"). Localized flooding issues have not been known to occur on the site. FEMA has classified the entire Pesante Creek watershed, including the Project site, as Zone C. Zone C flood insurance rate zones are portrayed as areas outside of the 100-year floodplain. These areas are subject to "minimal flooding" related hazards (FEMA, 1984).

4.9.2.6 Groundwater Resources

The North Monterey County Hydrogeologic Study (Fugro West Inc., 1996) described regional groundwater conditions. According to Furgo West, the Aromas Sand Formation is the principal water-bearing unit in the Project vicinity. The formation ranges in thickness from 100 to 800 feet and is a composite of interbedded sand, clay, and gravel that have been deposited in varied depositional environments. Regional groundwater recharge to the Aromas Sands formation occurs principally from deep percolation of precipitation (Fugro West, Inc. 1996.

Furgo West divided the North County area into smaller areas of similar hydrogeologic conditions. Furgo West considered the following factors during the delineation of the subareas: long-term availability of water, well yields, depth to bedrock, susceptibility to water quality problems, volume of groundwater storage, and sources of seepage. According to Furgo West, the Project site is located at the western edge of the Granite Ridge subarea, immediately east of the Highlands South subarea. Groundwater recharge at the Project site and groundwater yields for the Woodland Heights Mutual Water Company are likely influenced by hydrogeologic conditions in both subareas (Fugro West, Inc., 1996). See **Section 4.15 Water Supply** for more information regarding regional groundwater conditions.

Haro, Kasunich and Associates encountered localized groundwater as part of exploratory drilling conducted in support of the preliminary geological analysis.[3] Specifically, Haro, Kasunich and Associates encountered groundwater approximately eight (8) feet bgs on originally proposed Lot 19 (now Lot 16) in the location of the proposed detention-retention pond for Sub-basin 2. Because regional geologic conditions indicate groundwater levels are not likely to be much higher than sea level, it can be assumed that this groundwater represents perched

[3] The preparation of the preliminary geologic and geotechnical investigation involved exploratory boreholes to depths of 16.5 to 26.5 feet below the ground surface ("bgs").

groundwater from irrigation and/or seasonal rainfall and is not a reflection of the regional groundwater elevation (Haro, Kasunich and Associates, 2004).

4.9.2.7 Groundwater Quality

The quality of groundwater in northern Monterey County is generally very good for most all water supply uses. In the upper zones, not affected by seawater intrusion, groundwater quality is generally of a calcium bicarbonate chemical character with electrical conductivity averaging 450 micromhos/cm. However, elevated concentrations of nitrate ions from septic systems and agricultural return flows have degraded groundwater quality in some localized areas of the Granite Ridge and South Highlands subareas. Elevated nitrate concentrations tend to be found in shallower wells drawing from within about 125 feet of the water table. Deeper groundwater zones are less likely to be affected by surface pollutant sources; but they are subject to impacts from seawater intrusion (e.g., elevated chloride concentrations) where the wells extend below mean sea level. Within the impacted areas, the nitrate levels in upper groundwater zones and chloride levels in deeper groundwater zones have been found to be increasing over time (Fugro West, Inc. 1996).

Groundwater quality in the immediate vicinity of the Project site is reflected in the results from well water sampling at Woodland Heights Mutual Water Company Wells No. 1 and No. 2, which is the proposed water supply for the Project. The water quality is monitored for various constituents as required by the County of Monterey Health Department. Overall, the quality of water from these two wells is relatively hard, with trace amounts of several constituents and discernable amounts of others, moderate turbidity, and no bacteriological contamination. Well No. 1, the standby source, has been in continual compliance with Title 22 of California Code of Regulations. No treatment has been required or proposed for this well. Raw water from Well No. 2 is in compliance with Title 22 for all primary drinking water standards except arsenic; treatment was added for arsenic in 2004. Additionally, iron and manganese levels exceed secondary drinking water standards. Secondary contaminants are those that do not pose a health threat to consumers, but can affect the taste, odor, and/or color of the water. Treatment for iron and manganese was also added in 2004 upgrades to the Woodland Heights water system. Water quality data for Well No. 2 for the years 2016 through 2020 are presented in **Table 4.15-3** (**Section 4.15 Water Supply**). The data are for raw water from the well, with post-treatment values for arsenic, iron, and manganese.

4.9.3 REGULATORY ENVIRONMENT

4.9.3.1 Federal

Clean Water Act. Congress enacted the Clean Water Act ("CWA") in 1972, and Congress has amended the CWA several times since then. The CWA is the primary federal law regulating water quality in the United States and forms the basis for state and local laws throughout the country. The objective of the CWA is to reduce or eliminate water pollution in the nation's rivers, streams, lakes, and coastal waters. The CWA prescribes the basic federal laws for regulating discharges of pollutants as well as sets minimum water quality standards for all waters of the United States. Several mechanisms are employed to control domestic, industrial, and agricultural pollution under the CWA. At the Federal level, the U.S. Environmental Protection Agency ("EPA") administers the CWA. At the state and regional level, the State Water Resources Control Board ("SWRCB") and the Regional Water Quality Control Boards ("RWQCB") administer and enforce the CWA. The State of California has developed several water quality laws, rules, and regulations to assist in implementing the CWA and related Federally mandated water quality requirements. In many cases, the Federal requirements set minimum standards

and policies, and the laws, rules, and regulations adopted by the State and Regional Water Boards are more stringent.

National Flood Insurance Program. FEMA established the National Flood Insurance Program ("NFIP") to reduce flooding on private and public properties. The program provides subsidized flood insurance to communities that comply with FEMA regulations protecting development in floodplains. As part of the program, FEMA publishes Flood Insurance Rate Maps ("FIRM") that identify Special Flood Hazard Areas ("SFHA"). An SFHA is an area that would be inundated by the one-percent annual chance flood, which is also referred to as the base flood or 100-year flood.

4.9.3.2 State

Porter-Cologne Water Quality Control Act. The Porter-Cologne Act (Division 7 of the California Water Code, Section 13000) is the principal law governing water quality regulation in California. It establishes a comprehensive program to protect water quality and the beneficial uses of water. The Porter-Cologne Act applies to surface waters, wetlands, groundwater, and to point and nonpoint pollution sources. Pursuant to the Porter-Cologne Act, it is the policy of the State of California that:

- The quality of all the waters of the State shall be protected.
- All activities and factors affecting the quality of water shall be regulated to attain the highest water quality within reason.
- The State must be prepared to exercise its full power and jurisdiction to protect the quality of water in the State from degradation.

The Porter-Cologne Act defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The Porter-Cologne Act allows the State Board to adopt statewide water quality control plans or basin plans, which serve as the legal, technical, and programmatic basis of water quality regulation for a region. The act also authorizes the NPDES program under the Clean Water Act, which establishes effluent limitations and water quality requirements for discharges to waters of the State.

Under the Porter-Cologne Act, any person or entity discharging or proposing to discharge waste within the region (except discharges into a community sewer system) that could affect the quality of the waters of the State is required to file a Report of Waste Discharge. The State Board or RWQCB reviews the nature of the proposed discharge and adopts Waste Discharge Requirements to protect the beneficial uses of waters of the State. Waste discharge requirements could be adopted for an individual discharge, or a specific type of discharges in the form of a general permit. California Water Code Section 13269 authorizes the State or RWQCB to waive waste discharge requirements for specific discharges or specific types of discharges where such a waiver is consistent with any applicable state or regional water quality control plan and is in the public interest.

NPDES General Construction Activities Storm Water Permit Requirements. The CWA has nationally regulated the discharge of pollutants to the waters of the U.S. from any point source since 1972. In 1987, amendments to the CWA added section 402(p), which established a framework for regulating nonpoint source ("NPS") stormwater discharges under the National Pollutant Elimination System ("NPDES"). The Phase I NPDES stormwater program regulates stormwater discharges from major industrial facilities, large and

medium-sized municipal separate storm sewer systems (those serving more than 100,000 persons), and construction sites that disturb five (5) or more acres of land. NPDES requires construction sites that disturb between one (1) and five (5) acres of land to implement programs and practices to control polluted stormwater runoff. The Applicant is required to submit a Notice of Intent ("NOI") with the State Water Board to comply with NPDES permit requirements. The NOI includes general information on the types of construction activities that will occur on the site. The Applicant will also be required to submit a site-specific plan called the Storm Water Pollution Prevention Plan ("SWPPP"). The SWPPP will include a description of appropriate Best Management Practices ("BMPs") to minimize the discharge of pollutants from the site. It is the responsibility of the property owner to obtain the permit prior to site construction.

4.9.3.3 Local

Central Coast Water Quality Control Plan ("Basin Plan"). The Water Quality Control Plan for the Central Coastal Basin, referred to as the Basin Plan, is the Central Coast Regional Water Quality Control Board's ("CCRWQCB's") master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The CCRWQCB is responsible for the development, adoption, and implementation of the Basin Plan. The most recent version of the Basin Plan was approved in March 2019. The Proposed Project is required to adhere to all water quality objectives identified in the Basin Plan.

Beneficial Uses of Surface Waters. The Basin Plan defines beneficial uses for surface waters and groundwater in its corresponding jurisdiction. Once beneficial uses have been identified, compatible water quality standards are established to ensure the continuance of the beneficial uses.

The beneficial uses of Pesante Creek have not been defined in the Basin Plan. Tembladero Slough, located three (3) miles southwest of the Project site, is the closest waterway hydrologically connected to Pesante Creek. In this case, the tributary rule, which assigns the beneficial uses of major waterways to their tributaries, is not relevant due to the fact that Tembladero Slough is a tidally-influenced brackish body of water. Surface water bodies within the Central Coast Region that do not have beneficial uses designated to them are assigned the following designations:

- Municipal and Domestic Water Supply.
- Protection of both recreation and aquatic life.

County of Monterey 1982 General Plan. The County of Monterey General Plan includes policies related to hydrology and water quality. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing** for a detailed analysis of the Project's consistency with the County's General Plan hydrology and water quality policies. Relevant policies including the following:

3.1.1 Erosion control procedures shall be established and enforced for all private and public construction and grading projects.

3.2.2 Lands having a prevailing slope above 30% shall require adequate special erosion control and construction techniques.

5.1.2 Land use and development shall be accomplished in a manner to minimize runoff and maintain groundwater recharge in vital water resource areas.

6.1.1 Increased uses of groundwater shall be carefully managed, especially in areas known to have groundwater overdrafting.

6.1.2 Water conservation measures for all types of land uses shall be encouraged.

9.2.1 Land use practices which could result in siltation and pollution of inland and marine waters shall be carefully managed in order to assure a clean and productive habitat.

21.1.1 The County shall establish growth policies which are integrated with the natural limitations of the County's surface and groundwater bodies to sustain acceptable quality.

21.1.2 The County shall assume an active role in initiating and supporting beneficial water quality programs that affect the County.

21.1.3 The County shall maintain the erosion control ordinance and update it as new information becomes available.

21.1.6 The County shall identify, and have the property owner repair or destroy, wells that contribute to groundwater degradation; wells shall be repaired or destroyed according to state standards and such actions shall be reviewed and approved by the County Environmental Health Department.

21.1.7 The County shall monitor surface and groundwater quality to warn of potential problems.

21.1.9 The County shall promote and support the investigation of the source of, and remedies to, the nitrate pollution problems.

21.2.1 The County shall require all new and existing development to meet federal, State, and County water quality regulations.

21.2.2 The County shall allow only those land uses which do not pollute the groundwater system beyond acceptable limits.

21.3.3 No division of land or use permit for residential, commercial, or industrial uses shall be approved without proof that an adequate waste disposal system can be developed.

21.3.4 The County should determine the number of septic systems that can be developed in an area before groundwater is threatened. Except for single-family residences on existing lots of record, development should not exceed that number unless approved alternative wastewater systems are provided. The North County Planning Area should be given first priority in any studies undertaken.

26.1.4.3 A standard tentative subdivision map and/or vesting tentative and/or Preliminary Project Review Subdivision map application for either a standard or minor subdivision shall not be approved until:

- The Applicant provides evidence of an assured long-term water supply in terms of yield and quality for all lots which are to be created through subdivision. A recommendation on the water supply shall be made to the decision-making body by the County's Health Officer and the General Manager of the Water Resources Agency, or their respective designees.

- The Applicant provides proof that the water supply to serve the lots meets both the water quality and quantity standards as set forth in Title 22 of the California Code of Regulations, and Chapters 15.04 and 15.08 of the Monterey County Code subject to the review and recommendation by the County's Health Officer to the decision making body.

53.1.3 The County shall not allow water consuming development in areas which do not have proven adequate water supplies.

53.1.4 New development shall be required to connect to existing water service providers which are public utilities, where feasible.

53.1.5 Proliferation of wells, serving residential, commercial, and industrial uses, into common water tables shall be discouraged.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the area. The NCAP includes policies related to hydrology and water quality. Please refer to **Table 4.10-5** in **Section 4.10, Land Use, Population, and Housing,** for a detailed analysis of the Project's consistency with applicable NCAP policies related to hydrology and water quality policies.

3.1.4 (NC) Where any land use activity results in repeated, excessive runoff or soil erosion, the County shall require that the problems created by such activities be remedied by the property owner. For the purposes of this policy, excessive runoff and/or erosion are defined as that in excess of the runoff or erosion produced from the land under undisturbed conditions. All landowners shall be encouraged to retain runoff and eroded soil on-site, but where this is not feasible, sufficient improvements must be made to prevent alteration of or damage to, natural drainage channels and downstream property. For each violation the County shall set a time period of up to two years to allow conformance with this policy. Should runoff and erosion problems continue beyond the established time period the County may issue an order to discontinue the land use activity and convert the property to a less intensive land use.

5.1.3 (NC) Developments shall be designed to maximize groundwater recharge capabilities and to minimize runoff from the property.

6.1.3 (NC) New development shall be phased until a safe, long-term yield of water supply can be demonstrated and maintained. Development levels that generate water demand exceeding safe yields of local aquifers shall only be allowed once additional water supplies are secured.

16.2.11 (NC) New development in North County shall be required to limit peak storm runoff to pre-project or pre-soil disturbance levels, unless otherwise dictated by the Monterey County Flood Control and Water Conservation District ("MCFCWCD"). Runoff shall be limited by construction of detention ponds or other approved measures. In areas where the potential for erosion also exists, detention ponds shall be constructed for the dual process of storm water detention and sediment control.

16.2.12(NC) Specific entities, such as homeowners associations or County service districts, shall be established and made responsible for the maintenance of detention ponds and other runoff and erosion control devices.

21.2.2.1 (NC) In areas where there is evidence that groundwater quality is being degraded due to contamination by on-site septic systems and sewer service is not available, development shall be allowed only on parcels with adequate area and soil characteristics to treat and absorb the wastewater without causing further degradation of local ground and surface waters.

26.1.4.3 (NC) A standard tentative subdivision map and/or vesting tentative and/or preliminary project review subdivision map application for either a standard or minor subdivision shall not be approved until:

1. The Applicant provides evidence of an assured long term water supply in terms of yield and quality for all lots which are to be created through subdivision. A recommendation on the water supply shall be made to the decision-making body by the County's Health Officer and the General Manager of the Water Resources Agency, or their respective designees.

2. The Applicant provides proof that the water supply to serve the lots meets both the water quality and quantity standards as set forth in Title 22 of the California Code of Regulations, and Chapters 15.04 and 15.08 of the Monterey County Code subject to the review and recommendation by the County's Health Officer to the decision-making body.

4.9.4 IMPACTS AND MITIGATION MEASURES

4.9.4.1 Thresholds of Significance

A project impact would be considered significant if the project would:

a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality;

b. 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;

ii. Substantially increase the rate or amount of surface water runoff in a manner which would result in flooding on- or off-site;

iii. 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;

iv. Impede or redirect flows;

c. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or

d. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

4.9.4.2 Areas of No Impact

Some of the significance criteria outlined above (b(iv), c, and d) are not applicable to the Proposed Project, or the Proposed Project would not result in impacts related to these criteria, as explained below. The impact analyses related to the other criteria (a, b(i), b(ii), and b(iii)) are addressed below**.**

b.(iv). *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: impede or redirect flood flows.* The Proposed Project does not entail altering a course of a stream or river such that the Proposed Project would impede or redirect flood flows. There are no streams or rivers located on-site. Moreover, the site is not located in an area subject to flooding-related hazards. In addition, the introduction of impervious surfaces associated with the development of residential uses on the site would not impede or redirect flood flows. Please refer to HYD-2 below for an evaluation of potential drainage related impacts due to the introduction of impervious surfaces and proposed drainage facilities associated with the Proposed Project. There would be no impact for the purposes of this criterion.

c. *In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.* The Proposed Project is not located in a flood hazard zone, nor a tsunami or seiche hazard area. This criterion is not applicable to the Proposed Project. There would be no impact for the purposes of this criterion.

d. *Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.* The Proposed Project would be in compliance with applicable water quality plans and the local sustainable groundwater management plan. For more information concerning potential water supply effects associated with the Proposed Project, please refer to **Section 4.15 Water Supply.**

4.9.4.3 Methodology

The following analysis is based on Questa's review of information submitted by the Applicant, including the location of proposed detention-retention facilities. Questa reviewed the size of the two (2) stormwater detention-retention facilities to determine whether they are sufficiently sized to accommodate potential increases in surface water runoff associated with the Proposed Project. The Applicant has not prepared a drainage plan for the Proposed Project, other than to indicate the proposed location and approximate footprint of two (2) stormwater detention-retention basins – one on the southerly side of proposed Lot 4 and one on the southerly side of proposed Lot 16 (formerly within proposed Lot 19). Questa assumed that a conventional stormwater drainage system, including a combination of open channels and buried storm drain lines, would be

constructed to collect, and convey runoff from building sites and roads to the two detention-retention basins. Questa further assumed that the storm drain systems would closely follow the existing topography and would not involve any alteration of the sub-basin watershed boundaries or transfer of water from one sub-basin to the other.

4.9.4.4 Impact Analysis

Impact HYD-1: The Proposed Project could result in potential water quality effects associated with the construction and operation of the Proposed Project. As a result, the Proposed Project could violate applicable water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criteria a and b(i)).

The Proposed Project could result in temporary water quality effects associated with construction-related activities. Temporary water quality impacts could occur due to ground-disturbing activities (e.g., grading) and the use of hazardous materials (e.g., diesel fuel, gasoline, lubricants, oils, hydraulic fluids, etc.). Project operation could also result in potential water quality effects due to the use of routine household products, polluted runoff from vehicles, etc. Operation of the Proposed Project could also potentially affect groundwater quality due to the operation of proposed septic systems. **Section 4.14 Wastewater Disposal** addresses the potential water quality effects due to increased nitrate loading associated with the use of on-site septic systems for each of the proposed residential lots. Please refer to that section for more information. The following analysis specifically evaluates the potential temporary construction-related water quality effects and operational water quality effects associated with the routine use of household products.

Construction

Project construction would consist of localized grading and vegetation removal to facilitate the construction of the Proposed Project and related improvements (e.g., roads, driveways, etc.). These activities could impact water quality due to temporary increases in sedimentation, erosion, hazardous material leakages (see **Section 4.8 Hazards and Hazardous Materials**), and other temporary construction impacts (e.g., debris, construction waste, etc.). Ground-disturbing activities and vegetation removal could increase soil erosion and result in potential water quality effects. Typical construction-related pollutants include soil and sediment, petroleum hydrocarbons and heavy metals from construction vehicles, and landscape fertilizers. These activities would occur primarily during construction and would be temporary in nature. The implementation of construction phase BMPs and erosion control measures would minimize temporary construction phase water quality impacts; see **Section 4.6 Geology and Soils** for more information concerning potential erosion-related impacts.

As discussed in **Section 4.6 Geology and Soils,** site soils have a moderate erosion hazard. Alterations in drainage patterns and grading during construction could compound and increase erosion on-site thereby resulting in potential temporary water quality effects due to increased erosion. Earthwork for roads, building sites, and utilities would occur on approximately one-third of the project site, including approximately 5,400 cubic yards of grading. Site grading would include stripping surface vegetation and organic material and excavating/cutting of earth materials from the higher elevation areas and filling the lower elevation areas.

Because some grading would occur on moderate slopes, the Proposed Project would increase soil erosion from soil disturbance by subjecting unprotected areas to the erosional forces of runoff.

Grading for the Proposed Project would be required to comply with the Monterey County Erosion Control Ordinance. Section 16.12.060 of the ordinance requires that the Applicant prepare an Erosion Control Plan ("ECP") prior to permit issuance for building, grading, or land clearing. The ECP must include a description of erosion control BMPs to be used at the Project site during construction for the control of stormwater runoff, erosion, and sediment movement. Applicable BMPs may include:

- Stockpiling and disposing of demolition debris, concrete, and soil.
- Protecting existing storm drain inlets and stabilizing disturbed areas.
- Hydroseeding/re-vegetating disturbed areas.
- Minimizing areas of impervious surfaces.
- Implementing runoff controls (e.g., percolation basins and drainage facilities).
- Properly managing construction materials.
- Managing waste, aggressively controlling litter, and implementing sediment controls.
- Limiting grading to the minimum area necessary for construction and operation of the project.

In addition, the Proposed Project would also be required to comply with all Phase I NPDES General Construction Activities Permit requirements. Specifically, the Applicant would need to obtain coverage prior to site construction. As part of this process, the Proposed Project would be required to submit a Notice of Intent ("NOI") with the SWRCB. The filing must be accompanied by a SWPPP that outlines erosion control and stormwater quality management measures to be implemented during and following construction. The SWPPP would also provide a schedule for monitoring performance. While the SWPPP would include several of the same components as the ECP, the SWPPP would also include BMPs for preventing the discharge of NPDES pollutants beside sediment (e.g., fertilizers, petroleum hydrocarbons, paint, etc.) to downstream waters.

Compliance with County grading ordinances, NPDES permit requirements, and the SWPPP would reduce short-term water quality impacts to levels that are considered less-than-significant. The Proposed Project could potentially result in a significant erosion-related impact due to temporary construction-related activities. **This potentially significant impact would be reduced to a less than significant level through the implementation of Mitigation Measure HYD-1 below**.

Operation

Project operation could also result in water quality effects due to hazardous material leakages, use of household chemical products, increases in site erosion due to impervious surfaces (see discussion below), and associated increases in polluted runoff. Potential water quality effects could also occur due to vehicle leaks and maintenance activities. Maintenance activities could affect water quality due to the handling and use of hazardous materials (e.g., fertilizers, solvents, oils, etc.). These impacts would be temporary in nature, intermittent, and would not substantially increase potential water quality impacts such that there would be a significant impact. Moreover, the proposed detention-retention basins would capture the potentially polluted runoff. The basins would also capture sediment and allow most of the sediment to settle in the basins. Many

pollutants in stormwater, including lead, copper, zinc, phosphorus, and petroleum hydrocarbons adhere to sediment and fine particulates. Thus, the ability of a stormwater practice to remove many nutrients, trace metals, and petroleum hydrocarbons is largely related to its ability to remove suspended sediment and particulates. In summary, the proposed detention-retention basins would minimize potential operational water quality effects by promoting natural infiltration and vegetative uptake. **This would represent a less than significant impact. No mitigation is necessary to address operational impacts.**

Conclusion

The Proposed Project could result in potential construction-related impacts due to temporary increases in erosion and polluted runoff. Similarly, the Proposed Project could also result in potential water quality effects associated with residential use of the site. The temporary construction-related impacts would be minimized to a less than significant level through the implementation of the mitigation measures identified below. While future residential use of the site could result in an increase in potential sources of polluted runoff, the proposed detention-retention facilities would minimize those effects by allowing for natural uptake of polluted runoff through natural processes. **Overall, the Proposed Project would have a potentially significant impact on water quality that could be reduced to a less than significant level.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure HYD-1:

The Applicant shall prepare an ECP and a SWPPP, which includes the proper design and placement of sediment traps to prevent the discharge of sediments and pollutants into downstream waterways during construction.

Good housekeeping, waste containment, minimization of disturbed areas, stabilization of disturbed areas, the protection of slopes and channels, the control of the site perimeter, and the control of internal erosion during construction are the objectives of the BMPs to be included in the ECP and SWPPP. Potential BMPs include but are not limited to limited soil exposure through scheduling and preserving existing vegetation; stabilizing soils through seeding, planting, mulching; diverting runoff through earth diking, temporary drains, swales, and slope drainage; reducing velocity through outlet protection, check dams, slope roughening/terracing; trapping and filtering sediment through silt fencing, straw bale barriers, and brush and rock filters, storm drain inlet protection, and sediment basins.

Prior to the issuance of a grading permit, the Applicant shall submit evidence of a General Construction Activity Storm Water Permit obtained from the Regional Water Board to the HCD – Planning Services for review and approval.

Prior to the issuance of a grading permit, the Applicant shall submit a final drainage plan for review and approval to the HCD – Environmental Services for review and approval.

Impact HYD-2: The Proposed Project would substantially alter the existing drainage pattern of the site or area through the addition of impervious surfaces that could substantially

increase the rate or amount of surface water runoff in a manner that could result in flooding on- or off-site. Moreover, increases in impervious surfaces could also result in additional sources of runoff that could exceed the capacity of planned stormwater drainage improvements. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criteria b(ii) and b(iii).

The Proposed Project would result in the introduction of impervious surfaces in connection with the future development of the site. This would include impervious surfaces associated with new roadways, residential structures, patios, and other related improvements. The introduction of impervious surfaces would potentially increase surface water runoff that could result in on- or off-site flooding. Additionally, increases in impervious surfaces could also increase runoff, potentially exceeding the capacity of the proposed detention-retention facilities included as part of the Proposed Project. The Proposed Project would not, however, alter the course of a stream or a river.

Implementation of the Proposed Project would result in the conversion of partially undeveloped land to residential uses (the site is currently developed with three (3) existing residences and related infrastructure). This would result in an increase in impervious surfaces (i.e., roads, driveways, patios, rooftops) on the site as compared to existing pre-project conditions. Specifically, the Proposed Project would introduce an estimated 11.8 acres of impervious surfaces onto the site. An increase in impervious surfaces would result in an increase in peak runoff rates and the alteration of existing drainage patterns within the site. The increase in impervious surfaces could result in potential flooding-related hazards. Questa analyzed the Proposed Project's potential impacts on peak runoff for the 2-year, 10-year, and 100-year storm recurrence intervals using the Rational Method. **Tables 4.9-4a** and **4.9-4b** below compares pre-and post-development peak runoff at the downstream end of the Project site for the two Project sub-basins.

Table 4.9-4a
Pre- and Post-Development Peak Flows (cfs) – Sub-Basin 1 (18.0 acres)

Sub-basin	Estimated Peak Discharge – Existing Conditions	Estimated Peak Discharge - Proposed Conditions	Increase (cfs)	Percent Increase
Q_2	3.4	7.13	3.7	108%
Q_{10}	4.9	10.6	5.7	116%
Q_{100}	10.2	17.1	6.9	68%

Q 2 = estimated 2-year peak flow
Q 10 = estimated 10-year peak flow
Q 100 = estimated 100-year peak flow
Source: Questa Engineering Corporation, March 2007

Table 4.9-4b
Pre- and Post-Development Peak Flows (cfs) – Sub-Basin 2 (55.3 acres)

Sub-basin	Estimated Peak Discharge – Existing Conditions	Estimated Peak Discharge - Proposed Conditions	Increase (cfs)	Percent Increase
Q_2	10.0	14.4	4.4	44%
Q_{10}	14.7	21.3	6.6	45%
Q_{100}	30.1	37.7	7.7	26%

Q 2 = estimated 2-year peak flow
Q 10 = estimated 10-year peak flow
Q 100 = estimated 100-year peak flow
Source: Questa Engineering Corporation, March 2007

The Proposed Project would result in an estimated 68 to 116 percent increase in peak flows in Sub-Basin 1, and an estimated 26 to 45 percent increase in peak flows in Sub-Basin 2. Increases in peak flows would be mitigated by the two (2) detention-retention basins proposed on Lots 4 and 19 in Sub-Basins 1 and 2, respectively. The purpose of the two (2) detention-retention basins is two-fold: to detain excess runoff from the site ("detention") and to induce groundwater recharge ("retention").

According to the design criteria of the County of Monterey HCD Engineering Services detention-retention facilities shall be sized to store the difference between the 100-year post-development runoff and the 10-year pre-development runoff while limiting discharge to the 10-year pre-development rate. The proposed detention-retention facilities would need to be designed to meet this criterion. Questa used the Modified Rational Method to calculate the minimum amount of storage needed to reduce 100-year post-development runoff to 10-year pre-development runoff for a variety of storm durations. The Modified Rational Method estimates the runoff volume by calculating the difference between the inflow and outflow requirements for a specified storm duration (i.e., time of concentration). Estimated storage requirements are presented in **Table 4.9-5**; supporting calculations used in the analysis are provided in **Appendix K**.

Table 4.9-5
Minimum Storage Requirements for Detention-Retention Basins

LOT	Sub-basin	Minimum Storage Requirements
4	Sub-Basin 1	0.24 acre-feet
19	Sub-Basin 2	0.64 acre-feet

As described above, the Proposed Project includes two (2) detention-retention basins: one on the south side of Lot 4, which would serve Sub-basin 1; and the other on the south side of Lot 16, which would serve Sub-basin 2. Although the Applicant has not submitted any engineering details for the two (2) detention-retention basins, the proposed locations have sufficient area to accommodate the estimated minimum detention-retention storage requirements indicated in **Table 4.9-5**, assuming water storage depths averaging about two (2) to three (3) feet.

In addition to mitigating peak runoff impacts, the proposed detention-retention basins were reviewed in terms of their potential to enhance groundwater recharge. Percolation testing by Soil Survey, Inc. (December 2005) showed a relatively slow percolation of 1 inch per hour at the Lot 4 detention-retention basin, indicating a modest to low potential for stormwater percolation-recharge. In contrast, testing at the Lot 16 (formerly Lot 19) detention-retention basin by Questa Engineering in 2003 showed rapid percolation rates (> 60 inches per hour). The published Soil Survey also indicates high permeability rates of 6 to 20 inches per hour for the type

of soils present at the Lot 16 basin location (USDA, 1978). The soil borehole information at the Lot 16 detention-retention basin showed friable silty sand to a depth of 23.5 feet. These conditions indicate favorable conditions for achieving a substantial amount of stormwater percolation-recharge at this location.

The demonstrated high percolation rate of the silty sand soils at the Lot 16 detention-retention basin would be sufficient to allow retention and recharge of a high percentage (estimated >50%) of runoff from the common small and medium rainfall events. During the more infrequent large storm events, a higher percentage of runoff could pass through the detention-retention basin to downstream areas, depending on basin design. To confirm the feasibility for stormwater retention and recharge Questa completed example calculations of runoff-recharge for detention-retention basin site #2 (located on proposed Lot #16) using actual daily rainfall data for the 2018-19 water year (See calculations provided in **Appendix K**). The analysis demonstrated that, due to the size of the contributing drainage area, large available space for the basin, and rapid percolation rates, basin #2 alone can be designed to provide retention-percolation capacity equal to more than 50% of the total annual stormwater runoff for the entire site. Any stormwater percolation-recharge provided by the smaller detention-retention basin on Lot 4 would further increase the overall retention percentage above the 50% estimate.

Maximizing and managing the capacity of this basin for retention and groundwater recharge would provide a significant hydrological benefit. The final design of the facilities is subject to the review and approval of the MCWRA and the County of Monterey Department of Public Works, Facilities, and Parks ("PWFP"). Actual sizes of the detention-retention basins will be field measured and submitted to the MCWRA for review and approval.

The introduction of impervious surfaces would increase surface water runoff. This could result in potential localized flooding on- or off-site. In addition, the introduction of impervious surfaces could also increase surface water runoff such that it could exceed the capacity of detention-retention facilities included as part pf the Proposed Project. As noted above, the Proposed Project includes two (2) detention-retention facilities to minimize potential flooding-related hazards. Questa determined that there is sufficient space available to accommodate the estimated detention-retention storage requirements. However, mitigation is necessary to ensure that the detention-retention facilities are adequately designed to ensure that project-generated runoff does not exceed the capacity of either detention-retention facility. **This is considered a potentially significant impact that could be mitigated to a less than significant level through the implementation of the following mitigation measures identified below.**

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure HYD-2:

Prior to the recordation of the final map, the Applicant shall submit design-level subdivision improvement plans and supporting drainage calculations demonstrating that the two (2) proposed detention-retention basins can accommodate the 100-year storm event, with engineered design features to control the release of detained flows so as to not exceed pre-development 10-year storm levels. The detention-retention basin at the Lot 16 location shall include measures to enhance percolation and recharge to the maximum extent practicable. Prior to the recordation of the final map, the project

applicant shall submit a drainage plan to the PWFP and HCD-Environmental Services for review and approval.

4.9.5 REFERENCES

Federal Emergency Management Agency ("FEMA"). 2017. Flood Insurance Study for Monterey County, California, and Incorporated Areas. Available at: https://www.co.monterey.ca.us/home/showdocument?id=23971

Fugro West, Inc. 1996. *North Monterey County Hydrogeologic Study, Volume II, Critical Issues Report and Interim Management Plan.*

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4.10 LAND USE, POPULATION, AND HOUSING

4.10.1 INTRODUCTION

This section evaluates the potential land use, population, and housing impacts associated with the development of the Proposed Project. The following section 1) describes the existing environmental setting, 2) identifies the regulatory environment, and 3) evaluates the Proposed Project's potential adverse environmental effects and identifies the mitigation measures to reduce those effects, where necessary. The key sources of information for this analysis include the following:

- 2019 American Community Survey;
- 2020 Census Data (most recent available);
- 2022 Regional Growth Forecast prepared by the Association of Monterey Bay Area Governments ("AMBAG");
- County of Monterey Housing Element (2003 and 2016);
- County of Monterey General Plan (1982); and,
- Monterey County North County Area Plan (1985).

Table 4.10-1 summarizes the anticipated environmental effects of the Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.10.4 Impacts and Mitigation Measures**.

Table 4.10-1
Summary of Land Use, Population, and Housing Environmental Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measures	Residual Impacts
LU-1	The Proposed Project, as mitigated, would not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an adverse environmental effect.	Less than significant	None	Less than significant
LU-2	The Proposed Project would not induce substantial unplanned population growth in an area, either directly or indirectly.	Less than significant	None	Less than significant
LU-3	The Proposed Project would not displace a substantial number of people, necessitating the construction of replacement housing elsewhere.	Less than significant	None	Less than significant

4.10.2 ENVIRONMENTAL SETTING

4.10.2.1 Regional Setting

The Proposed Project is in northern Monterey County, in the unincorporated community known as Prunedale. The Proposed Project is approximately 5.5 miles north of the City of Salinas and 18 miles northeast of the City

of Monterey. The Project site is in the vicinity of U.S. 101 off Pesante Road, within the North County Area Plan of the Monterey County General Plan[1].

The North County Area Plan planning area is 72,720 acres and reflects a wide diversity of geographic features. The primary land use in the North County is agriculture, concentrated along the northern and southern regions of the planning area farmland totals 50,000 acres (or about 68.8 percent of the area). Grazing land dominates the area east of Highway 101 and into the Gabilan Mountains. Residential land uses are the second-largest land use and total approximately 4,393 acres (about six (6) percent) of the planning area, representing 10,223 housing units in 2020 (USCB 2020). Major residential centers are the unincorporated communities of Castroville, Moss Landing, Pajaro, Las Lomas, Aromas, and the Prunedale area with lower density residential land use spread throughout the central portion of North County. Public/quasi-public uses and commercial land uses are less concentrated in the planning area and account for approximately 2,403 acres (approximately three (3) percent) and 139 acres (about 0.2 percent), respectively (NCAB, 1985). Approximately 25 percent of the County population lives in unincorporated areas while the remaining 75 percent residing in the County's 12 cities. Salinas is the largest city, followed by Seaside, Monterey, and Marina.

4.10.2.2 Local Setting

Regional access to the site is provided via U.S. 101. Pesante Road and North King Road provide local access. The Project Site is primarily used for rural residential, as well as some limited agricultural uses (i.e., livestock). The site is approximately 46.4 acres. The APN is 125-101-016-000. The Project Site consists of gentle rolling hills with occasional steep to moderately steep flanks, cut by several broad, flat-bottomed drainages and numerous narrow sidehill drainage swales. Vegetation in the area includes a combination of oak woodland, disturbed annual grassland and maritime chaparral habitats. Existing improvements on the Project include dirt roads, which provide access to most of the parcel, existing residential structures, agricultural structures (e.g., small livestock pins, poultry coops, horse stalls), and other infrastructure. The property is surrounded by rural residential uses to the north, south, east, and west, including the existing 19-lot Woodland Heights Subdivision to the south. The Project site and surrounding land uses. The site is designated as Residential – Low Density (Monterey County, 1982), and is zoned as Low-Density Residential with a maximum density of 2.5 acres/du (LDR/2.5).

Population and Growth Projections. Based on current conditions and trends, growth is projected throughout the County, with no major changes in the geographic distribution of the population. **Table 4.10-2** presents the population of the communities surrounding the Proposed Project site through 2020, based on current population and historic trends.

Table 4.10-2
Current and Projected Population Summary By Jurisdiction

Place of Residence	2010 Census Population	2020 Census Population
Castroville	6,481	7,515
Prunedale	17,560	18,885
Salinas	150,441	163,542
Monterey County Total	415,057	439,035

Source: 2020 Population and Household data from the U.S. Census Bureau. "P1. Race: Decennial Census 2020."

[1]The Applicant submitted the application for the subdivision on May 30, 2002. The County deemed the application complete prior to the effective date of the 2010 General Plan, therefore, the following analysis contained evaluates the potential environmental effects of the subdivision under the 1982 General Plan. For more information see **Section 3.3 Project Background.**

Monterey County's total population resides in approximately 143,631 households (based on 2020 census data). Most of the County's housing stock is on the Monterey Peninsula and within Salinas **Table 4.10-3** shows the distribution of housing stock among the cities and the unincorporated parts of the County.

Table 4.10-3
Housing Stock in Monterey County (Dwelling Units)

Jurisdiction	Total Housing Units
Carmel-by-the-Sea	3,731
Del Rey Oaks	714
Gonzales	2,182
Greenfield	4,034
King City	3,526
Marina	8,135
Monterey	13,615
Pacific Grove	8,559
Salinas	42,675
Sand City	197
Seaside	11,594
Soledad	3,987
Total County	**141,910**
Total Unincorporated	**17,678**

* Unincorporated Communities of Monterey County
Source: 2016 - 2020 American Community Surveyhttps://dof.ca.gov/reports/demographic-reports/american-community-survey/#ACS2020x5

AMBAG assigns each community within its jurisdiction a "fair share" of the regional housing needs, and the communities are required to show how they will meet these needs. Based on the 2014-2023 AMBAG Regional Housing Needs Allocation Plan, the total number of new housing units that need to be constructed for the unincorporated areas of Monterey County between 2014-2023 to meet the County's "fair share" of the regional housing need is 7,386 (AMBAG, 2014). AMBAG developed this estimate based on various factors including projected population, jobs/housing considerations, household growth, land availability, vacancy rates, and replacement housing needs. The estimate includes very low, low, moderate, and above moderate-income households. In August 2021, the California Department of Housing and Community Development ("California HCD") issued a Regional Housing Needs Determination to AMBAG for the 6th Cycle planning period of 2023 – 2031. This determination made by the California HCD found that the region must zone to accommodate a minimum of 33,274 housing units during this period (AMBAG, 2022).

4.10.3 REGULATORY ENVIRONMENT

4.10.3.1 Local

County of Monterey 1982 General Plan. Pursuant to California Government Code Sec. 65300, each county and/or city is required to adopt a comprehensive, long-term general plan for the physical development of the county or city. The County of Monterey General Plan ("General Plan") is organized into four components (Natural Resources, Environmental Constraints, Human Resources, and County Development) and consists of individual goals, policies, and objectives for the physical development of the unincorporated area of the County. Moreover, the General Plan is comprised of eight sub-components known as Area Plans, which provide for the development of specific planning areas within the County. The Proposed Project site is located within the

North County Area Plan. The General Plan is intended to maintain and enhance the County's rural character, natural resources, and economic base by providing for adequate residential and industrial growth in areas best suited for development while restricting urban sprawl and indiscriminate development. The 1982 General Plan designates the Project site as Low Density Residential. Please refer to **Table 4.10-4** for a detailed analysis of the Project's consistency with applicable land use policies contained in the 1982 General Plan.

North County Area Plan. As one of the eight sub-components of the Monterey County General Plan, the North County Area Plan ("NCAP") contains additional policies that specifically relate to development within unincorporated North Monterey County. The NCAP policies are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The NCAP describes and designates various land uses within its planning area and identifies appropriate policies and standards which address local land use issues related to transportation and circulation, water supply, wastewater services, resource management, public services, and housing. Moreover, as identified in the NCAP, the plan seeks to reconcile the demand for growth with the need to preserve and enhance North County's attractive qualities for its residents and the need to ensure the long-term viability of North County's natural resources. Please refer to **Table 4.10-5** for a detailed analysis of the Project's consistency with applicable land use policies.

County of Monterey Zoning Ordinance. The County of Monterey Zoning Ordinance ("Title 21") implements the County's General Plan. Title 21 includes zoning districts with a list of allowable land uses and provides development standards and regulations related to specific site development, such as setbacks, building height limits, and other development standards. The Project site is zoned Low Density Residential ("LDR") with a density of 2.5 acres per unit under Title 21.The purpose of the LDR zoning district is to provide low density and intensity uses in the rural and suburban areas of Monterey County. LDR allows a maximum development density that shall not exceed the acres/unit shown for the specific LDR zoning district as shown on the zoning map and requires a minimum building site size of 1-acre unless otherwise approved as part of a clustered residential development.

Table 4.10-4
Project Consistency with Relevant County of Monterey General Plan Land Use Policies

Policy Number	Topic	Policy Summary	General Plan Consistency
5.1.2	General Plan – Water Conservation	Land use and development shall be accomplished in a manner to minimize runoff and maintain groundwater recharge in vital water resource areas.	Consistent. Development would be required to adhere to standard conditions of approval requiring the minimization of runoff. Furthermore, groundwater recharge would be maintained through the provision of on-site detention/retention ponds. Please refer to **Section 4.15, Water Supply**, for more information.
6.1.1	General Plan – Water Quality	Increased uses of groundwater shall be carefully managed, especially in areas known to have ground water overdraft.	Consistent. The Proposed Project would increase groundwater usage on-site through the introduction of new residential uses. As discussed in **Section 4.15, Water Supply**, the Proposed Project includes project design features to maximize groundwater recharge in comparison to existing pre-project conditions. Additionally, this EIR identified mitigation measures to ensure that potential increase in water demand associated with the Proposed Project does not increase water demand beyond anticipated on-site groundwater recharge to ensure that potential future water use is balanced. While the Proposed Project is in an area of potential groundwater overdraft, the Project includes design features, as well as project-specific mitigation, to ensure that potential impacts would be minimized. Moreover, the Proposed Project is also in Zone 2C.
6.1.2	General Plan – Water Quality	Water conservation measures for all types of land uses shall be encouraged.	Consistent. Development of the residential lots will be required to implement water conservation measures, including use of drought resistance native planting and water conserving plumbing fixtures.
7.1.1	General Plan - Vegetation	Development shall be carefully planned in, or adjacent to, areas containing limited or threatened plant communities and shall provide for the conservation and maintenance of the plant communities.	Consistent. The Proposed Project minimize impacts to the mixed oak woodland habitat and larger areas of high-quality maritime chaparral. Moreover, this EIR also includes mitigation measures to ensure that potential direct and indirect effects to biological resources are minimized. Finally, the Proposed Project also includes proposed scenic easements. These easements would ensure that these areas are preserved in perpetuity. Please refer to **Section 4.4, Biological Resources,** for more information.
7.1.2	General Plan - Vegetation	The County shall encourage the protection of limited or threatened plant communities through dedications of permanent conservation easements and other appropriate means.	Consistent. The Proposed Project includes proposed scenic easements to protect on-site biological resources. The County, as a condition of approval, would ensure that these areas are permanently conserved consistent with the intent of this policy. Please refer to **Section 4.4, Biological Resources,** for more information.
7.2.2	General Plan - Vegetation	Native and native compatible species, especially drought resistant species, shall be utilized to the extent possible in fulfilling landscaping requirements imposed as conditions of discretionary permits.	Consistent. Mitigation Measures identified in **Section 4.4 Biological Resources** require that only native and native compatible species shall be used in the Project landscaping.

Policy Number	Topic	Policy Summary	General Plan Consistency
9.1.1	General Plan – Wildlife Conservation	Development shall be carefully planned in areas known to have particular value for wildlife and, where allowed, shall be located so that the reasonable value of the habitat for wildlife is maintained.	Consistent. The Proposed Project would result in potential impacts to biological resources, including wildlife. While the Proposed Project would minimize impacts to the mixed oak woodland habitat and larger areas of high-quality maritime chaparral, which are both habitats that are valuable to wildlife species, this EIR includes mitigation to ensure that the Proposed Project would minimize impacts to a less than significant level. Mitigation Measures identified in **Section 4.4 Biological Resources** further ensure that potential impacts to biological resources would be minimized.
9.1.2	General Plan – Wildlife Conservation	Development shall be carefully planned in areas having high value for fish and wildlife reproduction.	Consistent. See response above.
12.1.6	General Plan – Archaeological Resources	Where development could adversely affect archaeological resources, reasonable mitigation procedures shall be required prior to project approval.	Consistent. Archaeological Consulting, Inc. prepared a report title *Preliminary Archaeological Reconnaissance* in April of 2007. The report included the analysis of records provided by the Northwest Regional Information Century data maps, historic-period maps, and literature for Monterey County. This report also reviewed existing files maintained by Archaeological Consulting, Inc. No cultural resources were identified in the Project site, however two (2) prehistoric archaeological sites were located within one (1) kilometer of the site. A Sacred Lands File of the Native American Heritage Commission did not find any record of Native American cultural resources in the Project are and no historical resources were identified based on review of the California Inventory of Historical Resources, Historical Landmarks, or National Register of Historic Places. Field reconnaissance conducted in April of 2007 did not identify any evidence of significant historic period archaeological resources. Although the Project would not directly affect a known archaeological resource or tribal cultural resource, construction activities have the potential to unearth buried or previously unknown resources. Therefore, mitigation measures have been included to minimize potential impacts to buried or unearthed cultural/archaeological resources. Please see **Section 4.4 Cultural and Tribal Resources**, for more information.
13.2.1	General Plan – Energy Resources	Intensive development shall be encouraged toward existing urban areas where energy expended for transportation and provisions of services can be minimized	Consistent. The Proposed Project site is designated as Low Density Residential and is not considered intensive development.
13.3.1	General Plan – Energy Resources	Lots shall be oriented so structures may maximize the energy gains from solar sources and minimize energy losses where possible.	Consistent. The Proposed Project will be required to comply with the most recent building standards (Title 24) which require installation of solar photovoltaic system (see **Section 4.2, Air Quality**). Additionally, the Proposed Project would comply with state and local policies regarding building design, energy efficiency and conservation.

Policy Number	Topic	Policy Summary	General Plan Consistency
13.3.2	General Plan – Energy Resources	Cluster development, at the same density, shall be favored over more scattered development on a given parcel of land, if such developed can be shown to conserve energy.	Not applicable. The clustering of development would not significantly conserve energy compared to the Proposed Project. The Proposed Project would be served by OWTS (i.e., septic) which requires setbacks from neighboring residences. Therefore, clustering development as described in this policy is not feasible.
13.3.3	General Plan – Energy Resources	Plans for major projects shall address opportunities for reducing energy used for transportation, including pedestrian and bicycle pathways, access to transit, and roadway design.	Not Applicable. The Proposed Project is not a major project.
13.4.2	General Plan – Energy Resources	All new residential dwellings shall be required to meet or exceed the building efficiency standards established by the State of California.	Consistent. The Proposed Project will comply with state and local policies regarding building efficiency and conservation. More specifically, the Proposed Project would comply with the California Building Standards Code, commonly referred to as Title 24 which contain standards to ensure buildings are energy efficient. Title 24 includes the California Green Building Standards Code ("CalGreen") which addresses planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. Please see **Sections 4.2, Air Quality** and **4.5, Energy.**
13.4.3	General Plan – Energy Resources	Building designs which reduce demands for artificial heating, cooling, ventilation, and lighting shall be encouraged.	Consistent. The Proposed Project will comply with state and local policies regarding building efficiency and conservation. Please see the policy summary above. The Proposed Project would comply with Title 24 of the California Code of Regulations. Please see **Sections 4.2, Air Quality** and **4.5, Energy.**
17.3.2	General Plan – Fire Hazards	The County shall require the creation of road maintenance agreements for all new private subdivision roads.	Consistent. The Project Applicant will be required to prepare and execute a road maintenance agreement subject to the review and approval of the County of Monterey.
17.3.3	General Plan – Fire Hazards	The County shall encourage all new development to be located within the response time of 15 minutes from the fire station responsible for serving the parcel. If this is not possible, on-site fire protection systems (such as fire breaks, fire-retardant building materials, and/or water storage tanks) approved by the fire jurisdiction must be installed or development may only take place at the lowest density allowed for the parcel by the General Plan.	Consistent. The Proposed Project site would be served by the North County Fire Protection District. The North County Fire Protection District operates three (3) fire stations, with the nearest station located approximately two (2) miles from the Project site. Consistent with the goals defined in the Monterey County General Plan, Safety Element, Emergency Services Section, the response times of the nearest station is approximately 12-mintues or less. Please see **Section 4.12**, **Public Services** for more information.

Policy Number	Topic	Policy Summary	General Plan Consistency
17.3.4	General Plan – Fire Hazards	The County shall require all new development to have adequate water available for fire suppression. Water availability can be provided from a conventional water system; from an approved alternative water system if within 300 feet of a habitable structure; by the fire fighting equipment of the fire district within which the property is located; or by an individual water storage facility--water tank, swimming pool, etc.--on the property itself. The fire and planning departments shall determine the adequacy and location of individual water storage to be provided.	Consistent. Adequate water will be available and stored on-site for fire suppression purposes. More specifically, the extension of the existing Woodland Heights Mutual Water Distribution System will be reviewed by the North County Fire Protection District and the County of Monterey Division of Environmental Health to ensure that adequate water is provided for on-site to meet potential fire related demands. As discussed in **Section 4.15, Water Supply**, existing production capacity is sufficient to serve the Proposed Projects' water demand. The installation of a standby well is required pursuant to **Mitigation Measure WS-6** which would further ensure adequate supply, including water used for fire flow.
17.3.5	General Plan – Fire Hazards	Water systems constructed, extended, or modified to serve a new land use or a change in land use or an intensification of land use shall be designed to meet, in addition to the average daily demand, the standards shown in Table 2, subject only to changes authorized pursuant to Policy Number 17.4.2.	Consistent. Extension of the existing Woodland Heights Mutual Water Distribution System will be subject to the review and approval of the County of Monterey Division of Environmental Health and will be reviewed for adherence to all applicable standards.
17.4.1	General Plan – Fire Hazards	All residential, commercial, and industrial structural development (not including accessory uses) in high and very high fire hazard areas shall incorporate recommendations by the local fire district before a building permit can be issued. SEE TABLE 2 (Fire Suppressions Standards).	Consistent. Prior to issuance of a building permit, project applicant will be required to implement and adhere to all applicable fire regulations as determined by the North County Fire Protection District.
17.4.12	General Plan – Fire Hazards	A zone which can inhibit the spread of wildland fire shall be required of new development in fire hazard areas to protect development. Such zones should consider irrigated greenbelts, streets, and fuel modification zones in addition to other suitable methods that may be used. The County should not accept dedications of any open space lands required as part of this fire prevention zone.	Consistent. Final plans will be required to implement fire hazard zones to reduce the potential for wildland fire hazards subject to the review and approval of the North County Fire Protection District.

Policy Number	Topic	Policy Summary	General Plan Consistency
21.2.2	General Plan – Water Quality	The County shall allow only those land uses which do not pollute the groundwater system beyond acceptable limits.	Consistent. As identified in **Section 4.9 Hydrology and Water Quality** and **Section 4.14, Wastewater,** development of the Proposed Project would not exceed applicable groundwater quality standards. Questa examined nitrate loading from septic system discharge from the Proposed Project and concluded that there could be potential for a significant increase in nitrate concentration in groundwater beneath the Project site and bordering areas to the west and south of the Project site. Contamination could exceed drinking water limits of 10 mg-N/L. However, Questa concluded that the implementation of mitigation measures identified in this EIR would ensure that impacts would be reduced to a less than significant level. Therefore, the Proposed Project would not pollute the groundwater system beyond acceptable limits. Please see **Section 4.14, Wastewater** for more information.
21.3.3	General Plan – Water Quality	No division of land or use permit for residential, commercial, or industrial uses shall be approved without proof that an adequate waste disposal system can be developed.	Consistent. The Proposed Project would be capable of accommodating adequate wastewater disposal on-site. Although significant impacts related to rapid/unsuitable percolation and groundwater mounding due to clustering of leachfield septic envelopes would result in a potentially significant impact. These impacts would be reduced to less than significant with the implementation of mitigation measures identified in **Section 4.14 Utilities and Service Systems** and **Section 4.14, Wastewater** ensure that wastewater disposal will be consistent with County of Monterey requirements.
22.2.1	General Plan – Noise Hazards	The County shall require new development to conform to the noise parameters established by Table 6, Land Use Compatibility for Exterior Community Noise Environments.	Consistent. Development of the Proposed Project would not substantially increase noise levels such that they would exceed applicable County standards. Please refer to **Section 4.11, Noise** for more information.
22.2.3	General Plan – Noise Hazards	The County shall require environmental review of all proposed new development, expansion of industrial facilities, and quarry excavation and processing activities which may increase the noise level in surrounding areas or generate noise levels greater than those specified in Table 3 [Monterey County General Plan].	Consistent. The Proposed Project would generate temporary construction noise and minor operational noise. Illingworth & Rodkin, Inc. prepared a noise analysis that evaluated the potential noise impacts associated with the Proposed Project. Illingworth & Rodkin, Inc. found that construction generated noise would, at times, exceed local standards but remain a less than significant impact with the implementation of standard construction Best Management Practices and mitigation measures identified in **Section 4.11, Noise**. Operational noise would increase the noise from existing levels, but not in excess of the County's standards. Please see **Section 4.11, Noise** for the full analysis.
22.2.5	General Plan – Noise Hazards	The County, in accordance with Table 6, should require ambient sound levels to be less at night (10 p.m. to 7 a.m.) than during the day.	Consistent. Development would not exceed applicable ambient noise standards. The Proposed Project would permanently increase noise on-site during project operation. This permanent increase in operational noise would not, however, exceed the standards set by the County of Monterey. Furthermore, the Proposed Project would comply with Municipal Code Chapter 10.60 which prohibits excessive or loud noises exceeding 85 dBA measured from 50 feet, or generate excessive nighttime noise between 9:00 p.m. and 7:00 a.m. See **Section 4.11, Noise** for more information.

Policy Number	Topic	Policy Summary	General Plan Consistency
26.1.4.3	General Plan – Land Use	A standard tentative subdivision map and/or vesting tentative and/or Preliminary Project Review Subdivision map application for either a standard or minor subdivision shall not be approved until: (1) The applicant provides evidence of an assured long-term water supply in terms of yield and quality for all lots which are to be created through subdivision. A recommendation on the water supply shall be made to the decision making body by the County's Health Officer and the General Manager of the Water Resources Agency, or their respective designees. (2) The applicant provides proof that the water supply to serve the lots meets both the water quality and quantity standards as set forth in Title 22 of the California Code of Regulations, and Chapters 15.04 and 15.08 of the Monterey County Code subject to the review and recommendation by the County's Health Officer to the decision making body.	Consistent. The existing Woodland Heights Mutual Water Distribution System has adequate capacity to accommodate the proposed 19 lot residential subdivision. Further, Project-specific mitigation require that adequate groundwater recharge facilities are constructed in order to ensure that Project development does not contribute to existing overdraft conditions in North Monterey County. Please see **Section 4.15, Water Supply** for more information.
26.1.6	General Plan – Land Use	Development which preserves and enhances the County's scenic qualities shall be encouraged.	Consistent. The Proposed Project would not detract from the scenic qualities of North Monterey County, nor is the Project site located in a visually sensitive area. The Proposed Project is consistent with the surrounding rural residential nature of the area. Please see **Section 4.1, Aesthetics,** for more information.
26.1.12	General Plan – Land Use	In order to preserve its open space and rural character, the County shall encourage the voluntary restriction of development through dedication of scenic or conservation easements, transfer of development rights, and other appropriate techniques.	Consistent. As a standard condition of approval, the Project applicant will be required to dedicate scenic and/or conservation easements to the County of Monterey. As depicted in **Figure 3-3 Vesting Tentative Map,** the Project Applicant has identified scenic easements to address this requirement through the voluntary dedication of land for conservation and scenic purposes.
26.1.13	General Plan – Land Use	The County shall encourage infilling on vacant non-agricultural lands within existing developed areas and shall encourage new development within designated urban service areas. Infilling development shall be compatible with surrounding existing development.	Consistent. The Proposed Project is consistent with the surrounding development, use, and density.

Policy Number	Topic	Policy Summary	General Plan Consistency
26.1.20	General Plan – Land Use	All exterior lighting shall be unobtrusive and constructed or located so that only the intended area is illuminated, long range visibility is reduced, and off-site glare is fully controlled.	Consistent. All exterior lighting will be required to be unobtrusive and constructed so that only the intended area is illuminated. Please see **Section 4.1, Aesthetics,** for more information.
27.3.3	General Plan – Residential Development	Residential subdivisions shall be sited with sufficient distance from normal agricultural activities to prevent these activities from becoming hazardous or attractive nuisances to the residents of the subdivisions.	Consistent. The site is surrounded by rural residential uses and is not adjacent to any normal agricultural activities.
37.2.1	General Plan - Transportation	Transportation demands of proposed development shall not exceed an acceptable level of service for existing transportation facilities unless appropriate increases in capacities are provided for.	Consistent. Development of the Proposed Project would not exceed applicable level of service for existing transportation facilities. Please see **Section 4.13, Transportation,** for more information. While the Proposed Project would not exceed applicable LOS standards, it is important to note that the Proposed Project would exceed OPR's small project screening threshold for VMT impacts. As a result, the Proposed Project would result in a significant and unavoidable VMT-related impact. While this would represent a significant impact, the Proposed Project would still be consistent with this policy since this policy relates to LOS standards as opposed to VMT thresholds.
38.1.5	General Plan – Minimizing Negative Transportation Impacts	Adequate traffic capacity shall be a criterion for development consideration.	Consistent. Project development would not exceed existing capacity on area roadways.
39.1.4	General Plan – Road and Highway Transportation	New development shall be located where there is existing road and highway capacity or where adequate road and highway capacity will be provided.	Consistent. The existing roadway network has adequate capacity to support the proposed development. Moreover, implementation of the Prunedale Improvement Project, which has been completed, will further enhance existing capacity.
47.2.1	General Plan – Educational Facilities	The County shall impose a housing impact fee on all new residential development in districts which demonstrate overcrowded classroom conditions for the purpose of funding interim school facilities.	Consistent. The Project Applicant will be required to submit payment to the County of Monterey for impacts to school facilities.
51.2.2	General Plan – Park and Recreation Facilities	County parks should be developed and distributed equitably, where feasible, in terms of population, geographic location, and recreation needs	Consistent. The Proposed Project would not increase the use of existing neighborhood or regional parks or other recreational facilities such that deterioration of the facility would occur. Nor does the Proposed Project include recreational facilities or require the construction or expansion of recreational facilities. Please see **Section 4.12, Public Services,** for more information.

Policy Number	Topic	Policy Summary	General Plan Consistency
53.1.3	General Plan – Water Service	The County shall not allow water consuming development in areas which do not have proven adequate water supplies.	Consistent. The Proposed Project is located in Zone 2C of the Salinas Valley Water Project which has been determined to have sufficient water supply for the Project. Pumping tests determined that there is sufficient source capacity and water supply facilities to accommodate the increase in demand associated with the Proposed Project. Moreover, the Water Balance Analysis prepared by Questa also indicated the future water demand associated with the Proposed Project would balance. This EIR includes mitigation measures to ensure that future water demand balances on-site and that water demand does not exceed the amount identified in this EIR. Please see **Section 4.14, Water Supply** for more information.
53.1.4	General Plan – Water Service	New development shall be required to connect to existing water service providers which are public utilities, where feasible.	Consistent. Project development will be served via the Woodland Heights Mutual Water Distribution System.
53.1.5	General Plan – Water Service	Proliferation of wells, serving residential, commercial, and industrial uses into common water tables shall be discouraged.	Consistent. The Proposed Project would connect to the existing Woodland Heights Mutual Water Distribution System which was determined to have capacity to serve the Project (see **Section 4.15, Water Supply**). The Proposed Project will include the construction of a standby well to ensure adequate water supply capacity exists in the event of a well failure. The construction of this standby is necessary to ensure that adequate capacity is available in the event of well failure. This does not constitute the unnecessary proliferation of wells. This well would only be used during an emergency or when the existing operating well require maintenance.

Table 4.10-5
Project Consistency with Relevant North County Area Plan Land Use Policies

Policy Number	Topic	Policy Summary	North County Area Plan Consistency
3.1.4	North County Area Plan – Geology and Soils	Where land use activities result in repeated, excessive runoff or soil erosion, the County shall require that the problems created by such activities remedied by the property owner.	Consistent. The Proposed Project would comply with Monterey County Code Chapters 16.08 and 16.12 which address standards for all grading activities and help maintain safe grading conditions and erosion control. Chapter 16.12 set forth provisions for project planning, preparation of erosion control plans, runoff control, land clearing, and winter operations. This chapter also requires specific design considerations be incorporated into projects to reduce potential erosion. Mitigation measures would be implemented to minimize potential erosion related effects and include the development of a Storm Water Pollution Prevention Plan and a re-vegetation and landscaping plan. Please see **Section 4.6, Geology and Soils,** for more information.
3.2.4	North County Area Plan – Geology and Soils	The maximum residential density for individual parcels must be based upon slope using the formula provided in the policy.	Consistent. The Proposed Project will comply with slope configuration requirements as defined by this policy. The Proposed Project will also comply with Monterey County Cody Chapters 16.08 and 16.12 which address standards for grading activities and erosion control. HKA evaluated the Project site and indicated that there was no previous slope instability onsite. Mitigation measures would still be implemented to minimize potential hazards as they relate to slope instability. Please see **Section 4.6 Geology and Soils**, for more information.
5.1.3	North County Area Plan – Water Conservation	Developments shall be designed to maximize groundwater recharge capabilities and to minimize runoff from the property.	Consistent. Groundwater recharge and minimization of runoff was evaluated in **Section 4.15, Water Supply**. The Proposed Project would consist of the development of a stormwater detention-retention system which would increase the groundwater recharge. The Proposed Project would comply with Monterey County Code Chapter 16.08 and Chapter 16.12 which address erosion. Additionally, a Strom Water Pollution Prevention Plan would be required per **Mitigation Measure GS-2a** in **Section 4.6, Geology and Soils**. For additional information regarding water supply and erosion control, please refer to the consistency discussions above.
6.1.4	North County Area Plan – Water Quality	New development shall be phased until a safe, long-term yield of water supply can be demonstrated and maintained. Development levels that generate water demand exceeding safe yields of local aquifers shall only be allowed once additional water supplies are secured.	Consistent. Questa evaluated the water supply for the Proposed Project. The Project site is located in Zone 2C of the Salinas Valley Water Project which is considered to have long-term sustainable groundwater supply. While operational use would increase water use beyond existing levels, the mitigation measures identified in **Section 4.15, Water Supply** would ensure that significant impacts would be less than significant. Mitigation measures include limiting the number of units per parcel, utilizing low-flow plumbing fixtures, implementing drought tolerant landscaping, and to prohibit water intensive uses on site. Please see **Section 4.15, Water Supply** for more information.

Policy Number	Topic	Policy Summary	North County Area Plan Consistency
7.1.3	North County Area Plan - Vegetation	To retain the viability of threatened or limited vegetative communities and animal habitats, to promote the area's natural scenic qualities, and to preserve rare, endangered, and endemic plants for scientific study, the conservation of North County's remaining tracts of native vegetation shall be given high priority.	Consistent. The Proposed Project, as mitigated, is consistent with this policy. While the Proposed Project would result in potential impacts to biological resources, this EIR includes mitigation measures to minimize the extent of those impacts consistent with the intent of this policy. In addition, the Proposed Project also includes scenic easements in biological sensitive areas of the site. These easements would ensure the long-term preservation and protection of areas of high biological value. Please refer to **Section 4.4, Biological Resources,** for more information.
7.2.2.1	North County Area Plan - Vegetation	The County shall discourage the planting of non-native, invasive plant species and shall disallow the use of these plants in fulfilling landscaping or revegetation requirements imposed as conditions of discretionary permits.	Consistent. Mitigation measures identified in **Section 4.4 Biological Resources** ensure that only native and native compatible species shall be used in Project landscaping.
7.2.3	North County Area Plan - Vegetation	Property owners shall be encouraged to cooperate with the County in establishing conservation easements over areas of native vegetation.	Consistent. The Proposed Project includes scenic easements. As a standard condition of approval, the County will require the designation of conservation easements consistent with the intent of this mitigation.
8.2.1	North County Area Plan - Vegetation	The County shall discourage the removal of healthy, native oak and madrone tress in North Monterey County. A permit shall be required for the removal of any of these trees with a trunk diameter in excess of six inches, measure two feet above ground level. Where feasible, trees removed will be replaced by nursery-grown trees of the same species and not less than one gallon in size. A minimum fine, equivalent to the retail value of the wood removed, shall be imposed for each violation. In the case of emergency caused by the hazardous or dangerous conditions of a tree and requiring immediate action for the safety of life or property, a tree may be removed without the above permit, provided the County is notified of the action within ten working days. Exemptions to the above permit requirement shall include tree removal by public utilities, as specified in the California Public Utility Commissions' General Order 95, and by governmental agencies.	Consistent. A Forest Management Plan was prepared to identify impacts to native oak trees. Mitigation measures in the **Section 4.4 Biological Resources** ensure that native trees not planned for removal are protected during construction activities. The Proposed Project, as mitigated, would be consistent with this policy.
15.1.1.1	North County Area – Seismic, Geologic, Flood, and Fire Hazards	The North County Seismic Hazards Map shall be used to delineate high seismic hazard areas addressed by policies in the General Plan.	Consistent. The North County Seismic Hazards Map was used to evaluate seismic hazards for the Proposed Project. See **Section 4.6 Geology and Soils** for more information.

Policy Number	Topic	Policy Summary	North County Area Plan Consistency
16.2.1.1	North County Area – Flood Hazards	Site plans for new development shall indicate all perennial or intermittent streams, creeks, and other natural drainages. Development shall not be allowed within these drainage courses, nor shall development be allowed to disturb the natural banks and vegetation along these drainage courses, unless such disturbances are with approved flood or erosion control or water conservation measures.	Consistent. There are no perennial or intermittent streams, creeks, and other natural drainages on-site. Accordingly, the Proposed Project would not disturb the natural banks and vegetation along a drainage course.
16.2.11	North County Area – Flood Hazards	New development in North County shall be required to limit peak storm runoff to pre-project or pre-soil disturbance levels, unless otherwise dictated by the Monterey County Flood Control and Water Conservation District ("MCFCWCD"). Runoff shall be limited by construction of detention ponds or other approved measures. In areas where the potential for erosion also exists, detention ponds shall be constructed for the dual process of storm water detention and sediment control.	Consistent. Development of individual homesites, as well as installation of project infrastructure will be required to minimize runoff to pre-project conditions. Erosion control measures will be required to be implemented for all ground disturbance activities. The Proposed Project would comply with Monterey County Code Chapter 16.08 and 16.12 which address standards for grading activities and establish erosion control provisions for project construction. Furthermore, mitigation measures would be implemented and require the development of a Storm Water Pollution Prevention Plan. See **Section 4.6, Geology and Soils** for more information.
17.3.1.1	North County Area – Fire Hazards	All private driveways within newly created lots shall allow all-weather access by the local fire department' largest and heaviest vehicles. All height clearances and turns on these driveways must accommodate these vehicles.	Consistent. The Proposed Project would be required to adhere to all applicable fire and building safety codes defined by the Uniform Building Code and Uniform Fire Code. These fire and building safety codes include minimum fire flow requirements and new roads being designed with appropriate widths and turning radiuses to accommodate emergency service vehicles. Please see **Section 4.12, Public Services**, for more information.

Policy Number	Topic	Policy Summary	North County Area Plan Consistency
17.3.1.5	North County Area – Fire Hazards	Alternate routes of escape that will safely handle evacuations and emergency equipment should be established. In areas of high and very high wildland fire hazard as designated by the California Department of Forestry, no private dead-end road or cul-de-sac should be over 1,000 feet in length. In cases where the development is to be served by a dead-end road over 1,000 feet in length, the County Planning Department staff shall meet with a representative of the local fire protection agency and the developer to formulate a plan for provision of a secondary access. Such a plan for secondary access shall be implemented by the developer during pending and/or subsequent phases of development. If secondary access cannot be developed or if, in the case of individual lots of record the requirement for secondary access would place an unfair economic burden on the property owner, other alternatives to mitigate safety concerns should be considered.	Consistent. Secondary emergency access would be provided through an existing road and utility easement to North King Road from the proposed subdivision.
21.2.2.1	North County Area – Water Quality	In areas where there is evidence that groundwater quality is being degraded due to contamination by on-site septic systems and sewer service is not available, development shall be allowed only on parcels with adequate area and soil characteristics to treat and absorb the wastewater without causing further degradation of local ground and surface waters.	Consistent. As identified in **Section 4.14 Wastewater Disposal** the Proposed Project would dispose of wastewater via on-site septic disposal. Several proposed septic envelopes contained site soils that appeared to be inadequate to accommodate project-generated wastewater. The implementation of mitigation measures identified in **Section 4.14, Wastewater Disposal,** which recommend the merging of specific lots to ensure that on-site soils are capable of accommodating project-generated wastewater would ensure that the Proposed Project would be consistent with the requirements of this policy. Please refer to **Section 4.14, Wastewater Disposal,** for more information.
51.1.5	North County Area – Recreational Trails	The dedication of recreational trail easements shall be encouraged where appropriate for establishing a planned North County trails system, or where an established trail is jeopardized by impending development or subdivision activity.	Consistent. The Proposed Project would not increase the use of existing neighborhood or regional parks or other recreational facilities such that deterioration of the facility would occur. Nor does the Proposed Project include recreational facilities or require the construction or expansion of recreational facilities. Please see **Section 4.12, Public Services,** for more information.

County of Monterey Subdivision Ordinance. The Monterey County Subdivision Ordinance ("Title 19") is designed to regulate and control the division of land in unincorporated areas and to implement the provisions of the Subdivision Map Act. The provisions of the Subdivision Map Act more specifically address the design, improvement, survey data of subdivisions, and the process for securing the appropriate approvals. Title 19 is intended to preserve public health, safety, and general welfare, promote orderly growth and development, open space, and conservation, protect proper use of land, and ensure adequate traffic circulation, utilities, and other services within Monterey County. Furthermore, Title 19 ensures compliance with goals, objectives and policies of the Monterey County General Plan and Title 21(Sec. 19.01.010).

The Proposed Project is subject to Sec. 19.05.040 of the Monterey County Subdivision Ordinance. Findings of consistency with the Subdivision Ordinance are required to be made by the Board of Supervisors for the subdivision to be approved and for the Project to be consistent with the Subdivision Ordinance (Sec. 19.03.025). The Planning Commission may approve or deny, in whole or in part, the proposed development with appropriate findings, evidence, and conditions. (Sec. 19.05.055). Additionally, Pursuant to Sec. 19.03.015L, 19.05.040L, or 19.07.020K, the Planning Commission upon recommendation of the Health Officer shall make a finding that the source capacity and water quality for all lots meet the requirements of all applicable health and safety regulations prior to approval of the subdivision tentative map, or vesting tentative map, or tentative parcel map.

> 1. The Planning Commission shall make a finding, based on substantial evidence, upon the recommendation of the Health Officer, pursuant to Sec. 19.03.015L, 19.05.040L, or 19.07.020K, that the source capacity and water quality for all lots proposed to be created through the subdivision meets the requirements of all applicable health and safety regulations prior to approval of the standard subdivision tentative map, or vesting tentative map, or tentative parcel map.
>
> A tentative map shall be denied if any of the findings identified in Sec. 19.03.025F are found. 2. The Appropriate Authority shall make a finding, based on substantial evidence, upon the recommendation of the Health Officer, pursuant to Sec. 19.03.015 that the source capacity and water quality for all lots proposed to be created through the subdivision meets the requirements of all applicable health and safety regulations prior to approval of the tentative parcel map.

In addition, a tentative map shall be denied if any of the following findings are made (Sec. 19.03.025F):

> 1. That the proposed tentative map is not consistent with the applicable general plan, area plan, coastal land use plan, or specific plan.
>
> 2. That the design or improvement of the proposed subdivision is not consistent with the general plan, area plan, coastal land use plan, or specific plan.
>
> 3. That the site is not physically suitable for the type of development.
>
> 4. That the site is not physically suitable for the proposed density of development.
>
> 5. That the design of the subdivision or the proposed improvements are likely to cause substantial environmental damage or substantially and avoidably injure fish or wildlife or their habitat.

6. That the design of the subdivision or type of improvements is likely to cause serious public health problems.

7. That the design of the subdivision or the type of improvements will conflict with easement acquired by the public at large, for access through or use of, property within the proposed subdivision. In this connection, the appropriate decision-making body may approve a map if it finds that alternate easements, for access or for use, will be provided, and that these will be substantially equivalent to ones previously acquired by the public. This Subsection shall apply only to easements of record or to easements established by judgment of a Court of competent jurisdiction and no authority is hereby granted to a decision-making body to determine that the public at large has acquired easements for access through or use of property within the proposed subdivision.

8. That the subdivision fails to meet any of the requirements or conditions imposed by the Subdivision Map Act or this Title. The Planning Commission must make the above findings for the Project to be approved as proposed and for the Project to be consistent with Title 19 of the Monterey County Code.

County of Monterey Housing Element 2015-2023. State law specifies that the Housing Element must assess housing needs and evaluate the current housing market in the County, and then identify programs that will meet housing needs. The housing market evaluation includes a review of housing stock characteristics as well as housing cost, household incomes, special need households, availability of land and infrastructure and various other factors. Also included in this evaluation is the community's "Regional Housing Needs Allocation," which provides an estimate of the number of housing units that should be provided in the community to meet its share of new households in the region. In addition to this information, the Housing Element document must evaluate and review its past housing programs and consider this review in planning future housing strategies.

On June 15, 2010 the County adopted the previous Housing Element. Senate Bill 375, enacted in 2008, established an eight-year cycle for future housing element updates if the current document has been certified by the California Department of Housing and Community Development ("HCD") as substantially complying with State law (California Government Code 65588 (e)). On January 26, 2016, the County adopted an updated version of the Housing Element. This update of the Housing Element will be an eight-year plan, covering the planning period of December 31, 2015 through December 31, 2023.

County of Monterey Inclusionary Housing Ordinance. The County's Inclusionary Housing Ordinance was initially adopted in 1980 and has been revised several times since that date. The Ordinance was amended in 2011 (Ordinance No. 5175) and requires that all residential development consisting of five (5) or more units or lots in the County provide inclusionary units on-site or off-site or provide payment of an in-lieu of fee. More specifically, on-site inclusionary units must be constructed in an amount equal to or greater than twenty percent of the total number of units approved for the development. Similarly, off-site inclusionary units will be equal to or greater to the number of units that would have been required on-site. Both inclusionary development options would be required to meet the requirements of sections 18.40.070 and 18.40.080 of the Monterey County Code of Ordinance.

As for in-lieu, Sec. 18.40.050 states, The developer of a residential development containing five (5) or more units may elect to pay a fee in-lieu of providing some or all of the required inclusionary units if the developer demonstrates, in connection with the first approval for the residential development, that specific characteristics of the development site, such as lack of access to services, zoning which requires large lot development, or

potentially high site maintenance costs, make the site unsuitable for households at the required income levels. For residential developments which are permitted to satisfy the requirements of this Chapter in whole or part by payment of in-lieu fees, the fee amount shall be determined and approved by the Appropriate Authority as follows:

- For each market-rate unit in the residential development, the fee shall be one-fifth (⅕) of the difference between the affordable sales price for a four-person household at one hundred (100) percent of median income and the cost of developing an average market-rate three-bedroom home.
- The Director shall prepare an annual table which identifies in-lieu fee amounts based on criteria stated in the administrative manual.
- The annual in-lieu fee table shall be adopted by the Board of Supervisors.
- In the event that the Director does not prepare a revised annual table, or the Board of Supervisors does not approve one, the previous year's table shall remain in effect.

The Project would be consistent with the Ordinance at the time of completion by providing an in-lieu of fee.

4.10.4 IMPACTS AND MITIGATION MEASURES

4.10.4.1 Thresholds of Significance

A project impact would be considered significant if the Project would:

a. Physically divide an established community;

b. Cause a significant environmental impact due to conflict with any applicable land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating an environmental effect;

c. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example through extension or expansion of infrastructure);

d. Displace substantial numbers of people of housing, necessitating the construction of replacement housing elsewhere.

4.10.4.2 Areas of No Impact

Some of the significance criteria outlined above (a) are not applicable to the Proposed Project, or the Proposed Project would not result in impacts related to these criteria, as explained below. The impact analyses related to the other criteria (b, c, and d) are addressed below under **Section 4.10.4.3 Impact Analysis.**

a. *Physically divide an established community.* The Proposed Project would not physically divide an established community. No established residential or business communities exist within the Project site. As such the Project would not physically divide an established community.

4.10.4.3 Impact Analysis

Impact LU-1: The Proposed Project, as mitigated, would not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an adverse environmental effect. This represents a less than significant impact. No additional mitigation measures are warranted. (Criterion b).

The Proposed Project consists of a 19-lot low-density, rural residential, subdivision. The Proposed Project site is currently improved with three (3) existing residences and the Proposed Project would increase total number of on-site residences by introducing 16 new low-density single-family residences on the site. This would result in the introduction of approximately 51 new individuals on-site.[2] While the Proposed Project would increase the extent of on-site residential development, the Proposed Project, as mitigated, would not conflict with any applicable land use plan, policy, or regulation of an agency adopted for the purpose of avoiding or mitigating an environmental effect.

The following discussion examines the Proposed Project's consistency with relevant land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect.

Consistency with County of Monterey General Plan and North County Area Plan

Table 4.10-4 and **Table 4.10-5** summarize the Proposed Project's consistency with the County of Monterey 1982 General Plan and NCAP land use policies, respectively. As discussed above, the Proposed Project would include the construction of 19 new low-density single-family residences, each lot ranging in size from 1.17 to 5.3 acres with an average size of 2.4 acres. As outlined in **Table 4.10-4** and **Table 4.10-5**, potentially adverse environmental impacts associated with the Proposed Project would be minimized to a less than significant level through the implementation of various mitigation measures identified in this EIR. As such, the Proposed Project would not conflict with a policy adopted for the purpose of avoiding or mitigating an adverse environmental effect. The Proposed Project, as mitigated, is consistent with the 1982 General Plan and NCAP.

Consistency with County of Monterey Zoning Ordinance

As discussed above, the Project site is zoned and designated as Low-Density Residential with a maximum density of 2.5 acres/dwelling unit (LDR/2.5). The Proposed Project would include the construction of a 19-lot low-density, rural residential, subdivision with each lot ranging in size from 1.17 to 5.3 acres with an average size of 2.4 acres. Future residential buildout of the lots would be required to comply with all applicable Title 21 requirements.

Consistency with County of Monterey Subdivision Ordinance

As discussed above, the purpose of the Monterey County Subdivision Ordinance (Title 19 of the Monterey County Code) is to regulate and control the division of land in unincorporated areas and to implement the provisions of the Subdivision Map Act concerning the design, improvement, and survey data of subdivisions, and the form and securing of the appropriate approvals. The Proposed Project consists of a Vesting Tentative

[2] The Project site (see **Section 4.3 Project Description**) is primarily undeveloped; however, it currently includes three (3) single-family residences and related infrastructure. These three (3) structures and associated infrastructure will be improved during the construction of the Proposed Project, therefore while the total number of residences built equates to 19, only 16 of the residences contribute to the expansion of land use, population, and housing.

Map (see **Figure 3-3**) and is subject to Sec. 19.05.040 of the Monterey County Subdivision Ordinance. Findings of consistency with the ordinance are required to be made by the Board of Supervisors for the subdivision to be approved and for the Proposed Project to be consistent with the ordinance.

Consistency with County of Monterey Housing Element

The Project would be consistent with the County of Monterey Housing Element by providing new residential housing within an area of North Monterey County designated for residential development.

Consistency with County of Monterey Inclusionary Housing Ordinance

The Proposed Project would consist of the construction of 19 lot subdivision. Although the affordability of the Proposed Projects would not meet the requirement of this ordinance; the Proposed Project would be consistent with the County's Inclusionary Housing Ordinance as it would be required to contribute a percentage of all new development through payment of in-lieu fees to meet the County's affordable housing need as a condition of approval. The in-lieu of fees would be paid in full to the County prior to recordation of the final map (Sec.18.40.090 of the Monterey County Code).

The Project would have a less-than-significant impact associated with applicable land use plans and policy consistency.

Significance: Less than Significant.

Mitigation: None.

Impact LU-2: The Project would not induce substantial population growth in an area, either directly or indirectly. This represents a less than significant impact. No additional mitigation measures are warranted. (Criterion c).

The Project would slightly increase population in the area. The community of Prunedale's estimated population is 20,327(2019). Based on the County's Housing Element, the average household size is 3.23. Using this factor, the Proposed Project would generate 51 new persons on-site (excluding current site occupants associated with the three existing residences). This additional population represents about 0.002 percent of Prunedale's estimated population. The addition of 51 new persons to the Prunedale area would not be considered significant in terms of population growth. The Project includes development of private infrastructure, including roads, expansion of an existing water system, and individual septic systems, to accommodate the buildout of the Proposed Project. The private infrastructure would be sized and located to solely serve the subdivision within its boundaries. As a result, the Proposed Project would not indirectly induce population growth by providing additional infrastructure that could be used to support future growth and development. **This represents a less than significant impact and no mitigation measures are necessary.**

Significance: Less than Significant.

Mitigation: None.

Impact LU-3: The Project would not displace substantial numbers of people, necessitating the construction of replacement housing elsewhere. This represents a less than significant impact. No additional mitigation measures are warranted. (Criterion d).

The Project proposes a residential subdivision within a predominantly undeveloped area surrounded by existing rural residential uses. The Project site is designated for low density residential development by the County. The construction of a 19-lot subdivision would contribute towards the number of available housing units in the region. While the Proposed Project would displace existing persons on-site, the Project would increase the overall housing stock available in the region and the potential displacement of existing on-site residences would not constitute a substantial number of persons that would necessitate the construction of new housing elsewhere. Further, the Project would be required to contribute towards Monterey County affordable housing requirements through payment of in-lieu fees. Existing development on the Project site includes three single-family residences (mobile homes), water tanks, and supporting structures and infrastructure, which will be removed as part of the Project. The removal of the existing mobile homes, which are currently being rented, would not be considered a substantial displacement of existing housing or people. **This represents a less than significant impact and no mitigation measures are necessary.**

Significance: Less than Significant.

Mitigation: None.

4.10.5 REFERENCES

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4.11 NOISE AND VIBRATION

4.11.1 INTRODUCTION

This section assesses the potential noise impacts associated with the Project. The following section: 1) describes the existing environmental setting, 2) identifies the regulatory environment, including relevant state and local requirements, and 3) evaluates the potential environmental effects associated with the Proposed Project and identifies the mitigation measures to reduce the extent of impacts to a less-than-significant level, where feasible. The analysis contained in this section is based on the results of a noise assessment prepared by Illingworth & Rodkin, Inc (August 24, 2005). A copy of that report is contained in **Appendix J**. **Table 4.11-1** summarizes the anticipated environmental effects of the project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.11.4, Impacts and Mitigation Measures**.

Table 4.11-1
Summary of Noise and Vibration Environmental Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measures	Residual Impacts
NS-1	The Project would not expose persons to or generate noise levels in excess of standards established in the 1982 General Plan. The Proposed Project would result in temporary construction and operational noise. Noise generated by the Project, as mitigated, would not exceed any applicable noise standards set by the 1982 General Plan. Furthermore, temporary construction generated noise would be further minimized by standard best management practices ("BMPs").	Potentially significant	NS-1a NS-1b	Less than significant

4.11.2 ENVIRONMENTAL SETTING

4.11.2.1 Noise Fundamentals

Noise is defined as unwanted or objectionable sound. Sound consists of three variables: magnitude, frequency, and duration. The magnitude of variations in air pressure associated with sound waves results in the quality commonly referred to as "loudness." Variations in loudness are measured on the decibel ("dB") scale. The dB scale is logarithmic; noise at zero decibels is barely audible, while noise at 120-140 decibels is painful and may cause hearing damage.

The second characteristic of sound is frequency. The human ear responds to sounds whose frequencies are in the range from 20 hertz ("HZ") to 20,000 HZ. Within the audible range, subjective response to noise varies. People generally find higher-pitched sound to be more annoying than lower-pitched sounds. Noise is typically characterized using the A-weighted sound level or dBA. This scale gives greater weight to the frequencies that the human ear is most sensitive. The third characteristic of noise is duration. Annoyance due to noise is often associated with how long noise persists.

State and local regulations define objectionable noise levels and identify land use compatibility standards. For evaluating noise over extended periods, the "Day-Night Noise Level" ("L_{dn}") and the "Community Noise

Equivalent Level" ("CNEL") are used to express the average sound level ("L_{eq}") during a 24-hour period. The L_{eq} can be thought of as the steady sound level that, in a stated period of time, would contain the same acoustic energy as the time-varying sound level during the same period. These measures of noise account for greater sensitivity of noise receptors at night by adding five decibels to sound levels during evening hours (7:00 p.m. to 10:00 p.m.) and 10 decibels to sound levels during nighttime hours (10:00 p.m. to 7:00 a.m.).

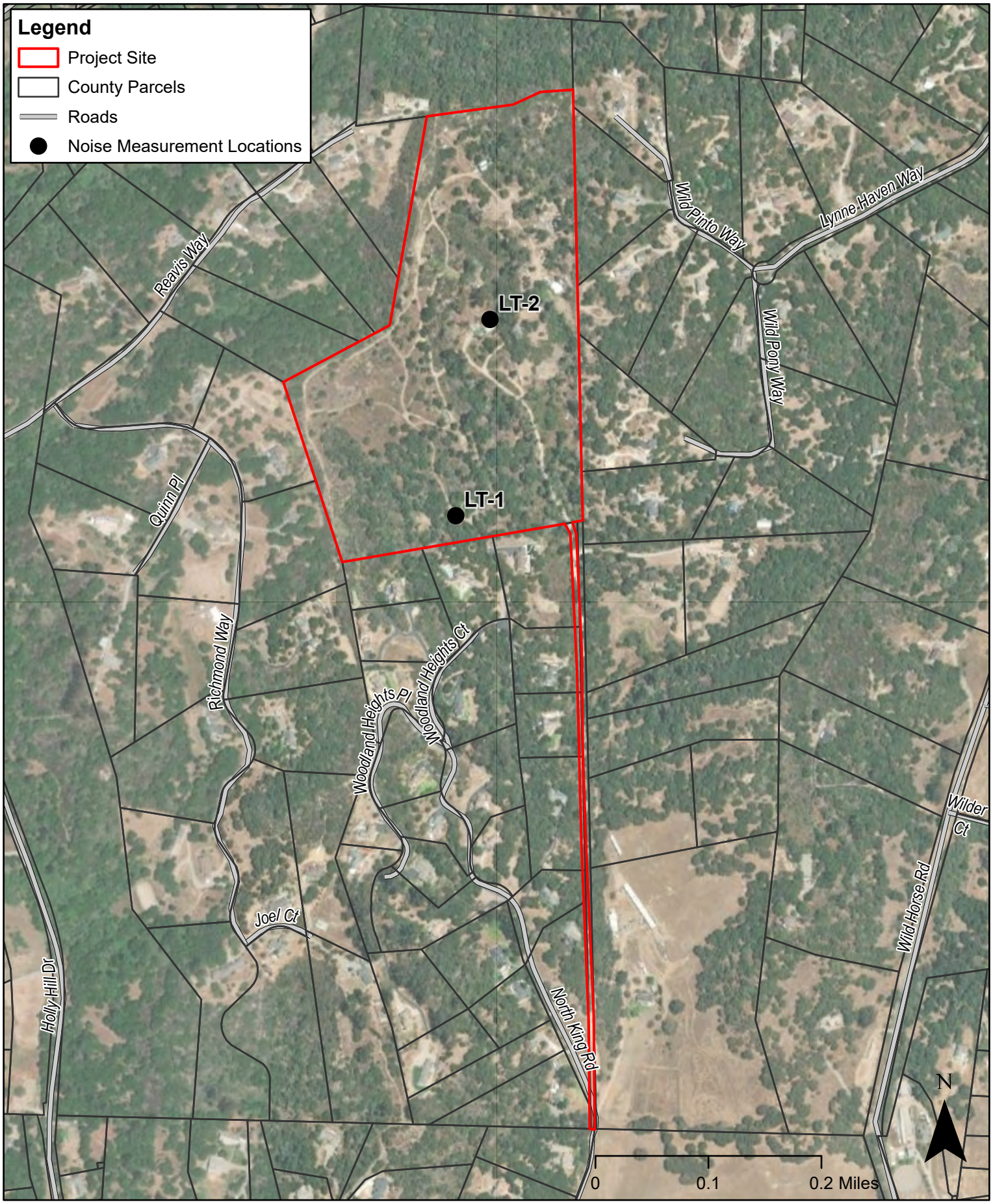
4.11.2.2 Existing Noise Levels and Conditions at Proposed Project Site

The Project is in an unincorporated rural area of northern Monterey County. The Project site is north of the Pesante Road/King Road intersection, approximately two (2) miles east of Highway 101 and is immediately adjacent to the existing Woodland Heights Subdivision. The Project area consists mainly of rolling hills supporting some grazing and rural residential development. Rural residential and semi-rural residential land uses surround the Project site. The nearest noise-sensitive residential land uses (Woodland Heights Subdivision) are approximately 0.25-miles south of the Project site.

Illingworth & Rodkin, Inc. conducted a noise monitoring survey from July 24, 2004 to July 27, 2004 to quantify the existing noise environment at the Project site and nearest residential uses. Illingworth & Rodkin, Inc. conducted two (2) long-term noise measurements to document the existing noise level trend over a 24-hour period. **Figure 4.11-1** shows the locations of long-term noise measurements. Illingworth & Rodkin, Inc. conducted the first long-term noise measurement near the south end of the Project site adjacent to Woodland Heights Subdivision. Illingworth & Rodkin, Inc. selected this monitoring location to represent the noise environment at the nearest existing residential land uses to the Project site. The CNEL calculated from the data collected was 39 dBA. Illingworth & Rodkin, Inc. selected a second long-term noise measurement location in the central portion of the site to document the noise level variation throughout the site. The CNEL calculated from the hourly noise data was 40 dBA. Based on the noise monitoring results, environmental noise levels are low. Data collected at each site are summarized in the noise analysis conducted by Illingworth & Rodkin, Inc. (August 24, 2005). See **Appendix J** for more information.

4.11.2.3 Sensitive Receptors

Noise sensitive receptors include residential uses, transient lodging (hotels/motels), schools, libraries, churches, hospitals, and nursing homes. Noise sensitive receptors in North Monterey County include schools, Zmudowski and Salinas River State Beaches, and Manzanita and Royal Oaks Parks (NCAP, 1985). The Project site is two (2) miles northeast of Central Bay High School and Prunedale Elementary. Similarly, the Project site is two (2) miles northeast of First Baptist Church – Prunedale and the Church of Christ – Prunedale. Sensitive receptors in the project area also include existing residences surrounding the Project site. The nearest existing residence is 100 feet southeast of the Project site. The "normally acceptable" noise range for low-density residential areas is 50 to 55 dBA. The "conditionally acceptable" noise range for low-density residential areas is 55 to 70 dBA. Development in areas where noise levels are "conditionally acceptable" may occur only after additional noise analysis is provided and mitigation measures are identified to mitigate potential noise-related effects (Monterey County, 1982).



Noise Measurement Locations	Date 7/1/2022	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 4.11-1
	Scale 1:7,000		

4.11.2.4 Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the Peak Particle Velocity ("PPV"), and another is the Root Mean Square ("RMS") velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

No major existing sources of groundborne vibration are in the Project area. Vehicle traffic on area roadways, particularly heavy-duty trucks, can result in increased groundborne vibration. However, groundborne vibration levels associated with vehicle traffic are typically considered minor.

4.11.3 REGULATORY ENVIRONMENT

4.11.3.1 State

California Building Code. The California Building Code regulates environmental noise intrusion into new single- and multi-family housing. Interior noise levels attributable to exterior sources shall not exceed 45 L_{dn}. Residential structures proposed where exterior noise levels exceed 60 L_{dn} shall require an acoustical analysis demonstrating that the proposed design will maintain interior noise levels at or below 45 L_{dn}.

4.11.3.2 Local

Monterey County 1982 General Plan. The County of Monterey General Plan provides policies in order to protect the population from noise and vibration related hazards. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing,** for a detailed analysis of the Project's consistency with the County's noise and vibration policies. Relevant policies are listed below:

22.2.1 The County shall require new development to conform to the established noise parameters.

22.2.3 The County shall require environmental review of all proposed new development, expansion of industrial facilities, and quarry excavation and processing activities which may increase the noise level in surrounding areas or generate noise levels greater than those specified in Table 3 [Monterey County General Plan].

22.2.5 The County should require ambient sound levels to be less at night (10 p.m. to 7 a.m.) than during the day.

Tables 4.11-2 and **4.11-3** define the 1982 Monterey County General Plan land use compatibility noise criteria.

Table 4.11-2
1982 General Plan Land Use Compatibility Noise Criteria

Land Use Category	Noise Range I*	Noise Range II*	Noise Range III*	Noise Range IV*
Passively used open spaces	<50	50-55	55-70	>70
Auditoriums, concert halls, amphitheaters	<50	50-65	65-70	>70
Residential – low density, single-family, duplex, mobile homes	<55	55-70	70-75	>75
Residential – multi-family	<60	60-70	75-70	>75
Transient lodging – motels, hotels	<60	60-70	70-80	>80
Schools, libraires, churches, hospitals, nursing homes	<60	60-70	70-80	>80
Actively used open spaces – playgrounds, neighborhood parks	<67	-	67-73	>73
Golf courses, riding stables, water recreation, cemeteries	<70	-	70-80	>80
Office buildings, business commercial and professional	<67	67-75	>75	-
Industrial, manufacturing, utilities, agriculture	<70	70-75	>75	-

* All noise ranges in LDN or CNEL DB
Source: Monterey County, 1982

Table 4.11-3
1982 General Plan Noise Zone Definitions

Noise Zone	Definition
Noise Zone I	*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.
Noise Zone II	*Conditionally Acceptable:* New construction or 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.
Noise Zone III	*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 feature included in the design.
Noise Zone IV	*Clearly Unacceptable:* New construction or develop should generally not be undertaken.

Source: Monterey County, 1982

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The NCAP does not include additional noise policies beyond those identified in the 1982 General Plan.

Monterey County Municipal Code (Chapter 10.60 Noise Control). The Monterey County Noise Ordinance is codified in Chapter 10.60 "Noise Control" of the Monterey County Municipal Code. The ordinance applies to "any machine, mechanism, device, or contrivance" within 2,500 feet of any occupied dwelling unit. Whereas the County's General Plan noise criteria apply to new proposed land uses, the noise ordinance is typically used for the control of noise form existing land uses. Additionally, Chapter 10.60 prohibits excessive or loud noises that result in a public nuisance. Specifically, no person shall operate machinery that produces a noise level exceeding 70 dBA measured from 50 feet (unless operated in excess of 2,500 feet from any occupied dwelling) or generate nighttime noise at certain levels between 9 p.m. and 7 a.m.

Groundborne Vibration. There are no federal, state, or local regulatory standards for groundborne vibration. However, criteria have been established to assist in the evaluation of vibration impacts. For example, the California Department of Transportation ("Caltrans") has developed vibration criteria based on potential structural damage risks and human annoyance. The criteria differentiate between transient and continuous/frequent sources. Transient sources of groundborne vibration include intermittent events, such as blasting, whereas continuous and frequent events would include vehicle traffic on roadways.

The groundborne vibration criteria recommended by Caltrans for evaluation of potential structure damage is based on building classification, which take into account the age and condition of the building. For residential structures and newer buildings, Caltrans considers a minimum peak-particle velocity ("ppv") threshold of 0.25 inches per second ("in/sec") for transient sources and 0.04 in/sec for continuous/frequent sources to be sufficient to protect against building damage. Continuous groundborne vibration levels below approximately 0.02 in/sec ppv are unlikely to cause damage to any structure. In terms of human annoyance, continuous vibration in excess of 0.04 in/sec ppv and transient sources in excess of 0.25 in/sec ppv are identified by Caltrans as the minimum perceptible level for ground vibration. Short periods of ground vibration in excess of 2.0 in/sec ppv can be expected to result in severe annoyance to people.

4.11.4 IMPACTS AND MITIGATIONS MEASURES

4.11.4.1 Thresholds of Significance

A project impact would be considered significant if the Project would:

a. Generation of 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. Generation of 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 or a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

In addition, the following local noise threshold criteria were used to evaluate the significance of noise impacts associated with the Proposed Project:

- a significant noise impact would be identified for a proposed land use if it would be exposed to noise levels exceeding the County's established guidelines for noise and land use compatibility, specifically, noise levels exceeding guidelines for "normally acceptable" noise range; or
- a significant noise impact would result if project-generated noise would expose existing noise sensitive receivers in the project vicinity to levels that are permanently or temporarily increased over existing conditions, subject to the following criteria:
    - a substantial permanent noise increase would occur if the project resulted in a noise level increase of 5 dBA or more where noise levels are currently below 55 dBA or 3 dBA or more where existing noise levels exceed 55 dBA;

- a significant noise impact would result from construction if noise levels are sufficiently high to interfere with speech, sleep, or normal residential activities; or
- construction-related hourly average noise levels received at noise-sensitive land uses exceeding 60 dBA $L_{eq(hr)}$, and at least 5 dBA above the ambient, would be considered significant if the noise-generating construction phase lasted more than 12 months.

4.11.4.2 Areas of No Impact

Some of the significance criteria outlined above (b and c) are not applicable to the Proposed Project, or the Proposed Project would not result in impacts related to these criteria, as explained below. The impact analyses related to the other criteria (a) are addressed below under **Section 4.11.4.3 Impact Analysis.**

b. *Generation of excessive groundborne vibration or groundborne noise levels.* Groundborne vibration moves through the ground and diminishes in strength with distance. Short-term construction-related groundborne vibration or noise could be generated by tractors, trucks, and jackhammers. However, the Proposed Project would not expose persons to the generation of excessive groundborne vibration or groundborne noise. Furthermore, the Proposed Project would not create operational groundborne vibration or noise. Therefore, the Project would not result in impacts associated with these sources.

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 or a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.* The Project is not located within an airport land use plan and is not located in the vicinity of a private airstrip. The nearest airport is located 9.5 miles to the south of the site.

4.11.4.3 Impact Analysis

Impact NS-1: The Project would not expose persons to or generate noise levels in excess of standards established in the 1982 General Plan. The Proposed Project would result in temporary construction and operational noise. Noise generated by the Project, as mitigated, would not exceed any applicable noise standards set by the 1982 General Plan. Furthermore, temporary construction generated noise would be further minimized by standard best management practices ("BMPs"). Therefore, this represents a less than significant impact with implementation of mitigation measures. (Criterion a).

The Proposed Project would result in temporary construction generated noise and minor permanent operational noise. Illingworth & Rodkin, Inc. prepared the *La Tourette Subdivision Environmental Noise Assessment Monterey County, California*, dated August 24, 2005. As discussed in further detail below, Illingworth & Rodkin determined that operational ambient noise would increase in connection with the Proposed Project, but the increase would not exceed local standards. Therefore, operational noise would be less-than-significant. Construction generated noise, however, while temporary, would generate noise at times that would exceed local standards, therefore posing a potentially significant impact. Construction generated noise would be reduced to less-than-significant with implementation of standard BMPs and mitigation measures identified below.

Construction

Construction of the Proposed Project would generate noise and would temporarily increase noise levels in the immediate vicinity of the Project site. Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Construction activities generate considerable amounts of noise, especially during the demolition phase and the construction of project infrastructure when heavy equipment is used. Construction of the Proposed Project would generally involve the following types of construction equipment: tractors, backhoes, compactors, rollers, and dump trucks. Most of the equipment would be brought to the site at the beginning of work and left there until the completion of construction. As necessary, trucks would bring materials such as water pipes, gravel, and asphalt to the site for construction of the infrastructure improvements. These deliveries would likely take place over a short period of time (e.g., less than a month). The estimated number of construction workers on-site at any one time to complete the infrastructure improvements would be approximately 20. The start of construction of the Proposed Project would depend on the Project approval date, seasonal factors, market conditions, and the contractor's schedule; Illingworth & Rodkin assumed construction for project infrastructure would be between three and nine months. The Project includes 9,220 cubic yards of cut and 6,410 cubic yards of fill for proposed residences, construction of an access road, and other infrastructure. An additional 1,200 cubic yards may be required for the improvements to the external access road.

The Monterey County Noise Ordinance (Monterey County Code Chapter 10.60, Noise Control) limits noise generated to 70 dBA at a distance of 50 feet from the noise source unless it is operated in excess of 2,500 feet from an occupied dwelling. The nearest receptors are approximately 100 feet southeast from the center of the Project site. These receptors are existing residences on the Project site and would be demolished as part of the project. The next nearest receptor is approximately 700 feet south of the center of the Project site. **Table 4.11-4** contains a list of typical equipment that could be used during construction and the anticipated noise levels at 50, 100, 200, and 400 feet from the source.

Table 4.11-4
Typical Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level (dBA) 50 ft from Source	Typical Noise Level (dBA) 100 ft from Source[1]	Typical Noise Level (dBA) 200 ft from Source[1]	Typical Noise Level (dBA) 400 ft from Source[1]
Air Compressor	81	75	69	63
Backhoe	80	74	68	62
Ballast Equalizer	82	76	70	64
Ballast Tamper	83	77	71	65
Compactor	82	76	70	64
Concrete Mixer	85	79	73	67
Concrete Pump	82	76	70	64
Concrete Vibrator	76	70	64	58
Dozer	85	79	73	67
Generator	81	75	69	63
Grader	85	79	73	67
Impact Wrench	85	79	73	67
Jack Hammer	88	82	76	70
Loader	85	79	73	67
Paver	89	83	77	71
Pneumatic Tool	85	79	73	67

Equipment	Typical Noise Level (dBA) 50 ft from Source	Typical Noise Level (dBA) 100 ft from Source[1]	Typical Noise Level (dBA) 200 ft from Source[1]	Typical Noise Level (dBA) 400 ft from Source[1]
Pump	76	70	64	58
Roller	74	68	62	56

Source: U.S. Department of Transportation, Transit Noise and Vibration Impact Assessment, 2006
Construction generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the source and receptor.

Based on the noise analysis prepared by Illingworth and Rodkin, the highest maximum noise levels generated by construction activities would typically range from about 90 to 98 dBA at a distance of 50 feet from the noise source. Thus, exceeding the Monterey County Noise Ordinance. However, typical hourly average construction-generated noise levels would be about 81 dBA to 89 dBA measured at a distance of 50 feet from the center of the site during busy construction periods. Construction-generated noise levels typically drop off at a rate of about 6 dBA per doubling of distance between the source and receptor. Shielding provided by buildings or terrain usually result in much lower construction noise. Noise generating activities associated with the construction of the Proposed Project would temporarily elevate noise in the vicinity of the project site. Project construction activities would yield noise levels greater than 60 dBA L_{eq} and at least 5 dBA L_{eq} above ambient noise conditions. Adjacent residential land uses would be exposed to temporary and periodic construction noise levels for approximately three to nine months. The nearest sensitive receptor is located 100-ft from the Project site; however, as stated above, these residences are located on the Project site and would be demolished as part of the Proposed Project. The next nearest sensitive receptor is approximately 700 feet south of the center of the Project site. Based on the above-mentioned maximum construction generated noise levels, construction generated noise would be between 83-92 dBA at 100 ft onsite.

While nearby receptors would not experience construction generated noise in excess of standards; conservatively, construction noise levels would still be considered a significant impact, but would be minimized with the use of standard construction BMPs and implementation of mitigation measures identified below. **Therefore, this would represent a less than significant level with mitigation.**

Operation

Illingworth and Rodkin evaluated potential operational noise impacts based on the results of a traffic analysis prepared by Hexagon Transportation Consultants, Inc. in 2007 Illingworth and Rodkin concluded that operational noise associated with increased traffic generated by the Project would not measurably increase existing noise levels at residential receptors in the vicinity of the Project site. In 2017, the Applicant submitted an updated traffic analysis prepared by Keith Higgins, PE, Traffic Engineer.[1] While Illingworth & Rodkin evaluated potential operational noise based on the trip generation estimates contained in the 2007 traffic report prepared by Hexagon Transportation Consultants, Inc., the updated traffic estimated developed by Keith Higgins in 2017 did not substantially change such that operational noise would be materially different than previously estimated by Illingworth and Rodkin. As a result, the following analysis summarizes Illingworth and Rodkin's operational noise analysis.

[1] In July 2020, the CEQA Guidelines were updated to change the metric for analyzing transportation impacts for new projects from Level of Service ("LOS") to Vehicle Miles Traveled ("VMT"). As a result, this EIR evaluates potential traffic-related effects based on the new VMT standard. However, the analysis of potential noise impacts relies on traffic trip estimates developed prior to the enactment of the new CEQA thresholds.

Illingworth & Rodkin compared existing AM and PM peak-hour traffic volumes to projected AM and PM peak-hour traffic volumes associated with the Project along roadway links in the Project vicinity. Illingworth and Rodkin determined that potential increased traffic trips along existing roadways in the vicinity of the Proposed Project would increase existing noise by less than 1 decibel, which would not be perceptible or measurable. Similarly, Illingworth & Rodkin also evaluated potential noise increases due to vehicle use along the site's access road. As discussed in this EIR, access to and from the site would be from either King Road or the Woodland Heights Subdivision. Illingworth & Rodkin conducted preliminary traffic noise modeling to calculate the hourly average noise level generated by increased vehicle accessing the site. The results of the traffic noise modeling indicate that hourly average noise levels generated by Project traffic would be 44 dBA L_{eq}. This noise level would be approximately equal to existing peak-hour noise levels measured near the Woodland Heights Subdivision. Maximum single event noise levels generated by an auto passing by at a distance of 25 feet would be approximately 50 to 60 dBA. These noise levels would also be similar to existing maximum noise levels at the nearest receivers.

A worst-case assessment would assume that the Project's traffic would increase the overall hourly L_{eq} by 3 dBA to 47 dBA L_{eq}. Similarly, the CNEL would increase by 3 dBA to 42 and 43 dBA. This noise level increase would be barely perceptible, and the impact would be considered less-than-significant since noise levels would still be well below the County's acceptable threshold for residential uses and would not exceed the 5 dBA significance threshold. The Proposed Project's operation would generate a slight increase in traffic volumes along the local roadway network serving the Project site; however, this increase in traffic would not substantially increase noise levels at noise sensitive receptors in the Project vicinity.

The Project site is in a semi-rural area away from noise sources, such as vehicular traffic on arterial roadways or highways. Existing noise levels at the Project site were measured at 39 and 40 dBA and are well below the County's acceptable exterior noise level limit of 55 dBA for new residential housing. Future noise levels at the Project site would not be expected to substantially increase over existing conditions. Interior noise levels within proposed residential units would also be less than 45 dBA, assuming standard construction practices. The existing and future noise environment at the Project site would be comparable to existing noise levels. **This represents a less than significant impact. No mitigation is necessary.**

Conclusion

The Proposed Project would result in temporary increases in ambient noise during construction, and minor increases in ambient noise during operation. As discussed above, construction noise, while temporary, would exceed local standards of noise resulting in a potentially significant impact. The implementation of standard construction BMPs and mitigation measures identified below would be reduce this impact to less-than-significant. Operation impacts would be minimal and represent a less-than-significant impact. **Together, this represents a less than significant impact with implementation of mitigation measures.**

Significance: Less than Significant

Mitigation:

Mitigation Measure NS-1a:

Prior to issuance of any grading permit or building permit, the Applicant(s) shall submit final construction specifications and improvement plans to HCD – Planning Services for review and

approval. The construction specifications and improvement plans shall identify the specific measures that will be implemented to reduce noise levels generated during construction. Applicable noise control measures include, but are not limited to, to following:

- Noise-generating activities at the construction site or in areas adjacent to the construction site shall be restricted to the hours of 8:00 a.m. to 5:00 p.m., Monday through Friday. No construction activities shall occur on weekends or holidays.
- All internal combustion engine driven equipment shall be equipped with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Unnecessary idling of internal combustion engines shall be prohibited.
- Stationary noise generating equipment shall be located as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.
- Quiet air compressors and other stationary noise sources shall be utilized where that technology exists.
- Radios shall be controlled as to not be audible outside of the project site.

Mitigation Measure NS-1b:

Prior to issuance of a building or grading permit, the contractor shall prepare a Construction Management Plan identifying the schedule for major noise-generating construction activities. The Construction Management shall identify a procedure for coordination with the adjacent occupied dwellings within 2,500 feet of the Project site so that construction activities can be scheduled to minimize noise disturbance. The plan will also identify a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and shall require that reasonable measures be implemented to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site, and a notice shall be sent to neighbors regarding the construction schedule.

4.11.5 REFERENCES

Hexagon Transportation Consultants, Inc. 2007. *LaTourette Subdivision Traffic Report*. Dated February 2007.

Illingworth and Rodkin, Inc. 2005. *Latourette Subdivision Environmental Noise Assessment Monterey County, California*. Dated August 24, 2005.

Keith Higgins, Traffic Engineer. 2017. LaTourette Subdivision, Traffic Impact Analysis, Prunedale, California. Dated October 4, 2017

Monterey County. 1985. *North County Area Plan and Amendments*. Adopted July 1985.

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4.12 PUBLIC SERVICES

4.12.1 INTRODUCTION

This section assesses the Proposed Project's potential impacts on public services and recreation. The following section 1) describes the existing environmental setting, 2) identifies the regulatory environment, including relevant state and local requirements, and 3) evaluates the Proposed Project's potential adverse environmental effects and identifies mitigation measures to reduce those effects, as necessary.

Table 4.12-1 summarizes the anticipated environmental effects of the Proposed Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.12.4, Impacts and Mitigation Measures**.

Table 4.12-1
Summary of Public Services Environmental Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measure	Residual Impact
PS-1	The Proposed Project would increase the demand for fire protection and police protection due to the introduction of new residential uses on a predominately undeveloped site. The increase demand for services would not, however, necessitate the construction of new or expanded facilities to maintain acceptable service ratios, responses times or other performance objectives.	Less than significant	None	Less than significant
PS-2	The Proposed Project would result in an increased demand for educational services, however the increase in demand would not result in the need to expand or develop new educational facilities. The Proposed Project would be required to pay applicable fees consistent with PRC65996(3)(h) of the California Government Code. The payment of fees would ensure that potential impacts are less than significant.	Less than significant	None	Less than significant
PS-3	The Proposed Project would generate solid waste during construction and operation of the Proposed Project. Solid waste generated would not result in the need for new or physically altered government facilities which could cause significant environmental impacts.	Less than significant	None	Less than significant
PS-4	The Proposed Project would incrementally increase the population in the area, which would increase the demand for recreational facilities. This incremental increase in demand for recreational facilities would not, however, increase the use of existing recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. Moreover, the Project does not include recreational facilities or require the construction or expansion of recreational facilities which would have an adverse physical effect on the environment.	Less than significant	None	Less than significant

4.12.2 ENVIRONMENTAL SETTING

4.12.2.1 Fire Protection Services

The North County Fire Protection District ("District") provides fire protection services within the Proposed Project area (Monterey County, 1985). In addition, the California Department of Forestry provides wildland fire suppression services. The District has mutual aid agreements with the City of Salinas Fire Department, the Monterey County Regional Fire District, the Aromas Tri-County Fire Protection District, and the City of Marina Fire Department. The District's jurisdiction encompasses approximately 122.9 square miles of predominately rural land with a population of approximately 42,000 (LAFCO, 2020). In 2020, the District responded to 99 major incidents (e.g., fires, rescue emergencies, hazardous conditions, etc.) (North County Fire, 2021), and 3,437 annual calls for service in 2019 (LAFCO, 2021). Currently, the District operates three (3) fire stations in Castroville, Prunedale, and Royal Oaks, and employs 22 full-time firefighters, and 15 reserve firefighters. The nearest fire station is located at 17639 Pesante Road, approximately two (2) miles from the Project site. A minimum of two (2) personnel are on duty at all times. The station is equipped with two (2) fire engines for structural fires, one (1) fire engine for wildland fires, and two (2) Station 4-wheel Drive Trucks (NCFPD, 2022); see also LAFCO, 2020). Average response time is approximately 12 minutes or less[1]. In addition to providing fire protection services, the District also provides first responder medical services within the Proposed Project area.

4.12.2.2 Police Protection Services

The Monterey County Sheriff's Department provides police protection services to the unincorporated areas of Monterey County, including the Project site. The Project site is served by the Central Patrol Station, which is located at 1414 Natividad Road, Salinas. The Central Patrol Station is currently staffed with 52 sworn officers and two (2) professional staff members. There are approximately three (3) shifts per day with an average of eight (8) deputies and one (1) sergeant on duty at all times. The Project site is within Beat 3A and is patrolled by one (1) on-duty officer. According to the Sheriff's Department, average response time to the Project site is approximately 14 minutes (pers. comm. Tracey Brown, 12/21/06) Most police activity occurring in the Proposed Project vicinity was in response to thefts, burglaries, vandalism, spousal abuse, and battery. The current Station Commander of this area is Commander Garrett Sanders.

The California Highway Patrol ("CHP") has jurisdiction and law enforcement powers on all County roads and state highways. The CHP enforces the vehicle code and responds to other matters related to vehicle use such as traffic accidents. The CHP services the unincorporated areas of Monterey County from its substation located at 960 East Blanco Road in the City of Salinas.

4.12.2.3 Schools

The Proposed Project lies within the North Monterey County Unified School District ("NMCUSD") service area, which serves the communities of Castroville, Moss Landing, Prunedale, Aromas, and unincorporated areas west of Salinas and north of the City of Marina. The NMCUSD consists of four (4) elementary schools, one

[1] The National Fire Protection Associated ("NFPA") is a national standards-setting body and establishes standards for fire protection matters. NFPA 1710 relates to the application of response time standards. Fire districts in Unincorporated Monterey County (including NCFPD) would find application of NFPA 1710 to be cost prohibitive, therefore do not have defined level of service, but rather, sets response goals based on those defined in the Monterey County General Plan, Safety element, Emergency Services Section (LAFCO, 2020).

(1) middle school, one (1) high school, and two (2) alternative education facilities. The middle school and high school are both in Castroville. The NMCUSD offers preschool programs and extended day classes and other after-school programs to support student academic achievement. For the 2019-2020 school year, student enrollment was approximately 4,594 students. **Table 4.12-2** depicts current student enrollment. The nearest elementary school to the Project site is located two (2) miles southwest at 17719 Pesante Road (Prunedale Elementary School).

Table 4.12-2
Current Student Enrollment

School	Grade Level	Student Enrollment	Capacity	Percent Capacity[1]
Castroville Elementary+	K-6	626	585	107%
Elkhorn Elementary	K-6	625	634	98.58%
Echo Valley Elementary	K-6	511	573	89.17%
Prunedale Elementary+	K-6	661	633	104%
North Monterey County Middle+	7-8	679	657	103%
North Monterey County High	9-12	1,257	1,353	92.90%
Central Bay High School	11-12	48	100	48%

Source: Ed. Data Education Data Partnership, 2021 and North Monterey County Unified School District, 2020.
[1] – Schools exceeding their capacity are denoted with a (+).

4.12.2.4 Parks and Recreation

Recreational opportunities within North Monterey County consist of state beaches, county parks, and special district parks (NCAP, 1985). The majority of recreational space in North County, however, is provided by County parks. There are no parks or public recreational areas near the Proposed Project. Manzanita Regional Park is located approximately 2.5 miles to the west and Royal Oaks Regional Park is located approximately 3.5 miles to the northwest of the site. Special Districts, including the Castroville Public Recreation District, Pajaro Community Services District, and the Moss Landing Harbor District, also maintain recreational facilities of varying sizes within North Monterey County. However, none of these special districts are located near the Project site.

4.12.2.5 Solid Waste

The Proposed Project is located within the jurisdiction of ReGen Monterey (formerly the Monterey Regional Waste Management District). Solid waste is collected by Waste Management, which serves the unincorporated areas of Monterey County. The ReGen Monterey's landfill has a permitted capacity of 3,500 tons per day of solid waste; currently, the landfill receives approximately 1,100 tons per day. The remaining landfill capacity is approximately 48 million tons or 72 million cubic yards. At current rates of disposal, the landfill will continue to serve the present service area for approximately 150 years.

4.12.3 REGULATORY ENVIRONMENT

4.12.3.1 State

Uniform Fire Code and California Building Standards Code. The Uniform Fire Code published by the International Fire Code Institute and the Uniform Building Code (adopted in California as the California Building Standards Code) published by the International Conference of Building Officials, both prescribe performance characteristics and materials to be used to achieve acceptable levels of fire protection.

Amendments to the California Building Standards effective in 2008 increased the requirements for defensible space and required more fire-resistant building materials and design than prior codes. These codes are in effect in areas identified as having severe fire hazards.

School Facilities Act of 1998 (SB 50). In 1998, the California State Legislature enacted SB 50, which made significant amendments to existing State law governing school fees. SB 50 prohibited state or local agencies from imposing school impact mitigation fees, dedications, or other requirements in excess of those provided in the statute. Government Code Section 65995(e) provides that where payment has been made to a school district in accordance with the school fee program that is considered full mitigation of any school impacts. The legislation also prohibits local agencies from denying or conditioning any project (including a general plan) based on the inadequacy of school facilities.

Quimby Act (California Government Code §66477). The Quimby Act (California Government Code §66477) was passed in 1975 and authorizes cities and counties to pass ordinances requiring developers to set aside land, donate conservation easements, or pay fees for park improvements. This provision of the State Subdivision Map Act enables cities and counties to require the dedication of land and/or payment of in-lieu fees for parks and recreation purposes as a condition of approval of a tentative map or parcel map subdivision. The dedication of land and/or payment of in-lieu fees must be based on parkland dedication policies and standards established in the city or county general plan. AB 1600 amended the Quimby Act in 1982 to hold local governments more accountable for imposing park development fees. The AB 1600 amendment requires agencies to clearly show a reasonable relationship between the public need for the recreation facility or parkland and the type of development project imposed upon the fee.

4.12.3.2 Local

Monterey County 1982 General Plan. The County of Monterey General Plan provides policies to ensure adequate access to public services and recreational uses. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing,** for a detailed analysis of the Proposed Project's consistency with the County's public services and recreation services. Relevant policies are listed below:

47.2.1 The County shall impose a housing impact fee on all new residential development in districts, which demonstrate overcrowded classroom conditions for the purpose of funding interim school facilities.

51.2.2 County parks should be developed and distributed equitably, where feasible, in terms of population, geographic location, and recreation needs.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The NCAP provides policies to ensure adequate access to public services and recreational uses. Please refer to **Table 4.10-5** in **Section 4.10, Land Use, Population, and Housing** for a detailed analysis of the Proposed Project's consistency with the NCAP policies related to public services.

17.3.1.1 (NC) All private driveways within newly created lots shall allow all-weather access by the local fire department' largest and heaviest vehicles. All height clearances and turns on these driveways must accommodate these vehicles.

51.1.5 (NC) The dedication of recreational trail easements shall be encouraged where appropriate for establishing a planned North County trails system, or where an established trail is jeopardized by impending development or subdivision activity.

4.12.4 IMPACTS AND MITIGATION MEASURES

4.12.4.1 Thresholds of Significance

A project impact would be considered significant if the project would:

a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered government 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 public services:
    1. fire protection,
    2. police protection,
    3. schools,
    4. parks,
    5. other public facilities.

b. 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; or,

c. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

4.12.4.2 Areas of No Impact

Some of the significance criteria outlined above (c) are not applicable to the Proposed Project, or the Proposed Project would not result in impacts related to these criteria, as explained below. The impact analyses related to the other criteria (a and b) are addressed below under **Section 4.12.4.3 Impact Analysis.**

c. *Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.* The Proposed Project would incrementally increase the population in the area, which would increase the demand for recreational facilities. This incremental increase in demand for recreational facilities would not, however, increase the use of existing recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. Moreover, the Project does not include recreational facilities or require the construction or expansion of recreational facilities which would have an adverse physical effect on the environment. Therefore, the Proposed Project would have no impact.

4.12.4.3 Impacts Analysis

Impact PS-1: The Proposed Project would increase the demand for fire protection and police protection due to the introduction of new residential uses on a predominately undeveloped site. The increase demand for services would not, however, necessitate the construction of new or expanded facilities to maintain acceptable service ratios, responses times or other performance objectives. This represents a less than significant impact. No mitigation measures are warranted. (Criterion a).

The Proposed Project would incrementally increase demand for public services including fire and police protection services due to the introduction of 19 new residential units and associated increased population. As identified elsewhere in this EIR, there are three (3) existing residences on-site that would be demolished. As a result, the Proposed Project would represent a net increase of 16 units on-site as compared to existing pre-project conditions. The Proposed Project is anticipated to increase the population served by North County Fire Protection District and Monterey County Sheriff's Department by 51 new individuals. This increased population would increase demand for services. For the reasons described below, the increased demand for services would not necessitate the construction of new or expanded public facilities to maintain acceptable service ratios, response times, or other performance objectives.

Fire Protection Services

The increased demand for fire protection services would be generated by the expansion of the service area and the potential for fire hazards, including but not limited to, structural fires, medical emergencies, and hazardous conditions associated with project development. As discussed previously, the nearest exiting fire station is approximately two (2) miles from the Project site, on Pesante Road. Due to the relatively small population generated by the Proposed Project, the distance to the nearest station, the Proposed Project would not trigger the need to construct a new fire station or to expand existing fire stations to maintain acceptable response times, performance standards, or level of service. Moreover, the Proposed Project would be required to adhere to all applicable fire and building safety codes (Uniform Building Code and Uniform Fire Code), including minimum fire flow requirements. New roads will be designed with appropriate widths and turning radiuses to accommodate emergency response and the transport of emergency/public safety vehicles. The Proposed Project would be designed to meet Fire District requirements regarding fire flow, water storage requirements, hydrant spacing, and emergency access. As a result, the Proposed Project would not require the construction of new or expanded fire protection facilities to serve the increased demand associated with the Proposed Project. **Therefore, this represents a less than significant impact.**

Police Protection Services

The increased demand for police services would be generated by potential crimes and misdemeanors that could occur within the Proposed Project site. The addition of 16 new residential units, would result in 51 residents. The increase in population would not warrant a new facility or additional staffing, nor would the Proposed Project affect response time (per. comms. Nicole Davis (9/3/2024)).The Monterey County Sheriff's Office requires each project applicant to satisfactorily comply with the Monterey County Public Safety and Security Guidelines. Compliance with these guidelines would improve public safety and security of the Proposed Project. **Therefore, this represents a less than significant impact.**

Conclusion

While the Proposed Project development would incrementally increase demand for services. Both the North County Fire Protection District and the Monterey County Sheriff's Department have indicated that the proposed development would have a negligible impact on existing service levels (pers. comm. Ron Stefani, 12/28/2006, Tracey Brown, 12/21/2006). **This represents a less than significant impact, and no mitigation measures are necessary.**

Significance: Less than Significant

Mitigation: None

Impact PS-2: The Proposed Project would result in an increased demand for educational services, however the increase in demand would not result in the need to expand or develop new educational facilities. The Proposed Project would be required to pay applicable fees consistent with PRC65996(3)(h) of the California Government Code. The payment of fees would ensure that potential impacts are less than significant. This would represent a less than significant impact. No mitigation measures are warranted. (Criterion a).

The Project site consists of three (3) existing residences and will be improved by the construction of 16 new residential units, which would increase the residential population by 51 new persons. The introduction of new residential units and associated increase in population on the Project site would increase student enrollment and thereby increase demand for educational services. This would represent a less than significant impact.

The NMCUSD currently operates four (4) elementary schools (grades K-6), one middle school (grades 7-8), one high school (grades 9-12), and three continuation/alternative schools. Development of the Proposed Project would generate additional students associated with the increase in population. The NMCUSD has prepared student generation rates for single and multi-family uses. Using these rates, Proposed Project buildout is anticipated to generate 9.9 school-aged children, as presented in **Table 4.12-3** below.

Table 4.12-3
Projected Student Generation

Grade Level	Generation Rate/Unit*	No. Units	No. New Students
K-6	0.346	16	5.5
7-8	0.086	16	1.4
9-12	0.184	16	3.0
		Total	**9.9**

* Based on generation rates single-family residential housing type
Source: North Monterey County Unified School District, 2020.

The Proposed Project would generate a student population of approximately 9.9 students, including 5.5 elementary students, 1.4 middle school-aged students, and 3.0 high school-aged students. As identified above, the enrollment at several schools exceeds capacity. For instance, Prunedale Elementary School, which is the closest school to the Project site, has a current student enrollment of 661, which exceeds the school's capacity by 28 students. Similarly, North Monterey County Middle School's current enrollment also exceeds the school's

capacity. As depicted in **Table 4.12-3**, the Proposed Project would add 6.6 new elementary grade students and 1.6 middle school-aged students to Prunedale Elementary School and North County Middle School, respectively. As a result, the Proposed Project would add additional students to two (2) area schools with current enrollment exceeding capacity. There is sufficient capacity at North Monterey County High School to accommodate the additional high-school aged students associated with the Proposed Project.

Although the Proposed Project would increase demand for school facilities beyond existing school capacity (i.e., Prunedale Elementary School and North Monterey County Middle School), this increased demand would not constitute a significant impact for the purposes of CEQA. This minor increase in demand would not necessitate the need for new or expanded facilities such that there would be a significant adverse impact. Moreover, this increased demand would be addressed through the payment of development impact fees. As noted above, the Applicant is required to pay developer fees as part of the permit approval process and in accordance with Policy 47.2.1 of the Monterey County 1982 General Plan. Pursuant to Section 65996(3)(h) of the California Government Code, payment of these fees "is 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." Fees collected pursuant to Section 65996(3)(h) of the California Government Code are used for the construction or reconstruction of school facilities. **Therefore, the Proposed Project would have a less than significant impact. No mitigation measures are necessary.**

Significance: Less than Significant.

Mitigation: None.

Impact PS-3: The Proposed Project would generate solid waste during construction and operation of the Proposed Project. Solid waste generated would not result in the need for new or physically altered government facilities which could cause significant environmental impacts. (Criterion a)

The Proposed Project would result in a population increase of approximately 51 new persons. Single family residences generate 12lbs/person/day (CalRecycle, 2021). Based on the anticipated increase in population, the Proposed Project would generate approximately 612 lbs per day (0.277 tons per day) and 223,380 lbs per year (101 tons per year). Solid waste generated during the construction and operation of the Proposed Project would be disposed of at ReGen Monterey's Monterey Peninsula Landfill and Recycling Facility in Marina. This landfill is permitted to receive 3,500 tons of waste per day but only receives 1,100 tons. It is expected to reach its permitted capacity in 2161. Solid waste generated by the Proposed Project would not have a substantial impact on the landfill's capacity as it would increase solid waste production by approximately 0.3 percent. Furthermore, solid waste generated during construction would be disposed of in compliance with all applicable regulations related to solid waste, including Section 5.408 of the 2016 CalGreen, which requires that at least 65 percent of non-hazardous construction waste (not including soil and land-clearing debris) is recycled or salvaged for reuse. **This represents a less than significant impact.**

Impact PS-4: The Proposed Project would incrementally increase the population in the area, which would increase the demand for recreational facilities. This incremental increase in demand for recreational facilities would not, however, increase the use of existing recreational facilities such that substantial physical deterioration of the facility would

occur or be accelerated. Moreover, the Project does not include recreational facilities or require the construction or expansion of recreational facilities which would have an adverse physical effect on the environment. This represents a less than significant impact. No mitigation measures are necessary. (Criterion b)

The Proposed Project site is primarily undeveloped except for three (3) existing residences and associated agricultural structures. The Proposed Project would represent a net increase of 16 new residential units on site as compared to pre-project conditions. At buildout, the site would include a of 19 single family residences. The Proposed Project would represent a population increase of approximately 51 persons. This population increase would increase demand for recreational facilities. For the reasons provided below, this increase in population would not substantially increase demand for existing facilities such that there would be a substantial physical deterioration of existing recreational facilities. Moreover, the Proposed Project does not include any recreational facilities or require the expansion of existing facilities such that an adverse environmental effect would occur.

The Proposed Project's increased demand for recreational facilities would be addressed through the Proposed Project's compliance with Section 19.12.010 of the Monterey County Code. Section 19.12.010(b) requires (as a condition of approval of a tentative map) that the subdivider shall dedicate land, pay a fee in lieu thereof, or both, at the option of the County. "The land dedicated, or the fees paid, or both, shall be used for local or regional community and neighborhood parks and recreational facilities… and the use of such parks and recreational facilities bear a reasonable relationship to the use of the park and recreational facilities by the inhabitants of the subdivision." (Monterey County Code, Section 19.12.010(b)). The County of Monterey requires that a minimum of three (3) acres of parkland per 1,000 residents be dedicated (Monterey County Code, Section 19.12.010(c)). According to Section 19.12.010, the average number of persons per dwelling used to determine the required parkland dedication is three (3) persons. As noted above, the Proposed Project would represent a population increase of 51 new persons. As a result, the Proposed Project would be required to dedicate 0.153 acres for on-site park and recreation improvements.

If there are no park or recreational facilities designated in the General Plan to serve the immediate and future needs of the residents of the subdivision, the subdivider shall, either dedicate land in the amount provided in Section 19.12.010(d) or pay a fee in lieu of dedication equal to the value of land prescribed for dedication in Section 19.12.010(d) and in an amount determined in accordance with the provisions of Section 19.12.010(g). (Monterey County Code, Section 19.12.010(e)(1)). For projects that are 50 parcels or less, if the project does not provide and has no park or recreational facilities, the subdivider shall pay a fee equal to the land value of the portion of the park and recreational facilities required to serve the needs of the residents of the proposed subdivision, unless on-site dedication is required by the County of Monterey. (Monterey County Code, Section 19.12.010(e)(2)). When a fee is required to be paid in lieu of parkland dedication, the amount of the fee shall be based upon the estimated fair market value of the unimproved land being subdivided and the estimated fair market value of the land which would otherwise be required to be dedicated according to Section 19.12.010(d). (Monterey County Code, Section 19.12.010(g)).

At the time of approval of the tentative map, the Board of Supervisors, shall determine, after a report and recommendation from the Director of Parks whether land, in-lieu fees, or a combination of both shall be dedicated and/or paid by the subdivider. (Monterey County Code, Section 19.12.010(j)(1)). Since the Proposed Project consists of less than 50 parcels, the subdivider will be required to pay an in-lieu fee equal to the fair market value of 0.153 acres to serve the immediate and future needs of the subdivision's residents. The payment

of this fee will ensure that the Proposed Project's potential effects to recreational facilities would be less-than-significant. **This represents a less than significant impact. No mitigation measures are necessary.**

Significance: Less than Significant

Mitigation: None

4.12.5 REFERENCES

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4.13 TRANSPORTATION

4.13.1 INTRODUCTION

This section evaluates the potential transportation effects associated with the development of the Proposed Project. The following section 1) describes the existing environmental setting, 2) identifies the regulatory environment applicable to the Proposed Project, and 3) evaluates the potential environmental effects associated with the Proposed Project and identifies applicable mitigation measures to reduce the extent of impacts to a less than significant level, where feasible.

On September 27, 2013, Governor Brown signed Senate Bill ("SB") 743, which went into effect in January 2014 and directed the Office of Planning and Research ("OPR") to develop revisions to the CEQA Guidelines to establish new criteria for determining the significance of transportation impacts. These revisions included the elimination of auto delay, level of service ("LOS"), and similar measures of vehicular capacity or traffic congestion as a basis for determining transportation impacts under CEQA. Instead, CEQA Guidelines Section 15064.3 was updated to establish vehicle miles traveled ("VMT") as the basis for evaluating transportation impacts. Automobile delay as measured by LOS or similar metrics is no longer considered a significant impact under CEQA. Further, Section 21099(a)(2) of the Public Resources Code states "automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to this division, except in locations specifically identified in the guidelines, if any." Therefore, the analysis in this section related to LOS is presented for informational purposes only.

This section is based on the following information:

- Hexagon Transportation Consultants, Inc., 2007. La Tourette Subdivision Final Traffic Report;[1]
- Keith Higgins, Traffic Engineer, 2017. La Tourette Subdivision Traffic Impact Analysis (**Appendix L**); and,
- Keith Higgins, Traffic Engineer, 2021. Proposal for La Tourette Subdivision Traffic Impact Analysis, Monterey County, CA (**Appendix M**).

Table 4.13-1 summarizes the anticipated environmental effects of the Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.13.4, Impacts and Mitigation Measures**.

[1] This section does not include a detailed description of Hexagon Transportation Consultants' ("Hexagon") 2007 *La Tourette Subdivision Final Traffic Impact Report*. The information contained in the *La Tourette Subdivision Traffic Impact Analysis* prepared by Keith Higgins, PE, TE, is reflective of current traffic conditions given the more recent traffic count information contained in that analysis.

Table 4.13-1
Summary of Transportation/Traffic Environmental Impacts and Mitigation

Impact	Summary	Significance	Mitigation	Residual Impact
TR-1	The Proposed Project would increase the extent of residential development on-site as compared to existing, pre-project, conditions. This would result in an increase in daily traffic trips associated with new residential uses. VMT associated with the Proposed Project would exceed OPR's small project screening threshold. This represents a significant and unavoidable impact. Due to the rural nature of the Proposed Project, there are no feasible mitigation measures available to reduce this impact to a less than significant level.	Significant and Unavoidable	None	Significant and Unavoidable
TR-2	The Proposed Project would potentially result in a traffic-related design hazard if Project generated truck traffic would be unable to safely maneuver through the Blackie Road intersection without encroaching into opposing traffic lanes.	Less than Significant	None	Less than Significant
TR-3	The Proposed Project would increase traffic due to the introduction of new residential uses on the site. The Proposed Project would not, however, result in inadequate emergency access.	Less than Significant	None	Less than Significant

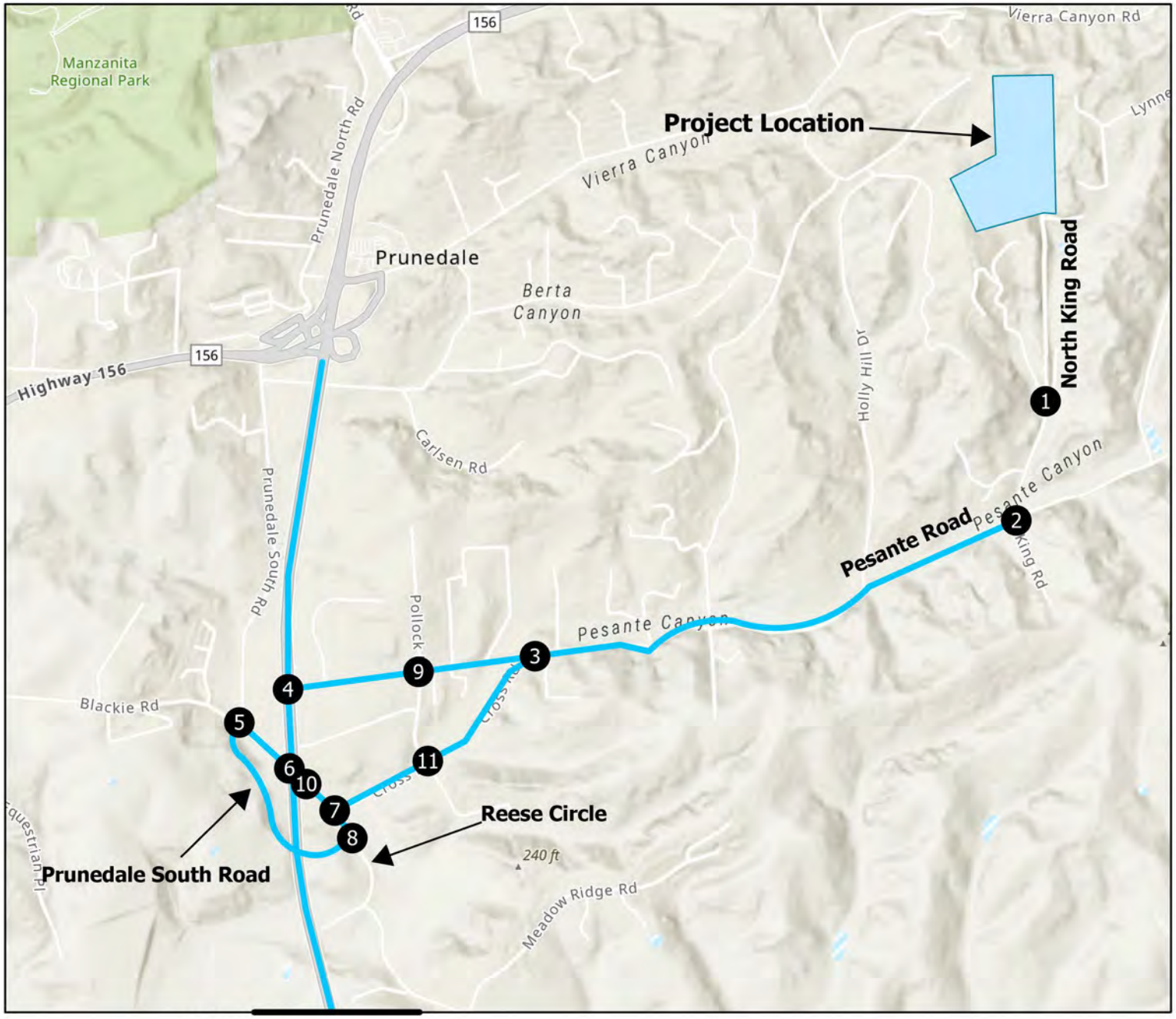
4.13.2 ENVIRONMENTAL SETTING

4.13.2.1 Existing Roadway Network

The Project site is located east of U.S. Route ("U.S.") 101, north of the intersection at Pesante Road and North King Road. Regional access to the Project site would be provided from U.S. 101 and the Pesante Road exit. Other regionally significant highways include State Route ("SR") 156 and SR 1 to the west and SR 68 to the southwest of the Project. Local access to the Project site would be provided from Pesante Road, North King Road, Cross Road, Country Meadows Road, Harrison Road, and Woodland Heights Road. The roadway network is presented in **Figure 4.13-1.** Below is a description of the local roadway network as described in the 2017 *La Tourette Subdivision Traffic Impact Analysis* (Higgins, 2017).

U.S. 101 is a four-lane highway that extends in a north/south direction through north Monterey County. Grade separated interchanges are located at the U.S. 101/SR 156 junction, about one mile north of the Pesante Road intersection, and at Sala Road, about two miles south of the Pesante Road intersection. At-grade intersections along U.S. 101 in the vicinity of the Project include Pesante Road, Blackie Road and Reese Circle, which all have acceleration and/or deceleration lanes that function as quasi on-ramps and off-ramps at U.S. 101.

Pesante Road is a two-lane county road and has pavement widths that vary from about 28 feet with 0 to 8-foot shoulders to about 20 feet east of Cross Road. The westbound Pesante Road approach to U.S. 101 is currently a stop sign-controlled approach. A right-turn lane is currently provided on the northbound U.S. 101 approach to Pesante Road and a right-turn acceleration lane is currently provided on northbound U.S. 101 north of the Pesante Road intersection. Left-turn movements from Pesante Road onto southbound U.S. 101 are currently prohibited.



Project Study Area/ Local Roadway Network

Date 6/29/2022

Scale 1:31,000

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure 4.13-1

North King Road is a two-lane north-south county road that extends north from Pesante Road for approximately eight-tenths of a mile. North King Road forms the north leg of an offset intersection with Pesante Road and King Road, which extends south of Pesante Road. For the purposes of this study, the North King Road-King Road / Pesante Road offset intersection was analyzed as a standard four-leg intersection. The northbound and southbound approaches at Pesante Road are stop-controlled.

Cross Road provides an alternative access between the easterly end of Pesante Road and U.S. 101 via Reese Circle. It is a two lane east-west county road that extends from Reese Circle to Pesante Road.

Country Meadows Road is a two-lane collector that extends between Harrison Road and Reese Circle. The Country Meadows Subdivision completed the Country Meadows Road connection between Harrison Road and Reese Circle. This connection provides an alternative access route from the Pesante Road area to Salinas, without having to use U.S. 101.

Harrison Road is a two-lane rural collector, which extends from Country Meadows Road south to Russell Road at the Salinas city limits. South of Russell Road, within the City of Salinas, Harrison Road becomes Main Street.

Reese Circle is a two-lane rural collector, which extends from US 101 to Country Meadows Road. West of U.S. 101, Reese Circle is Blackie Road.

Blackie Road is a two-lane east-west county road that extends from SR 183 in Castroville to U.S. 101.

Prunedale South Road is a two-lane north-south county road that extends from SR 156, through Prunedale North Road, to Reese Circle.

4.13.2.2 Existing Transit Service

The primary public transit service in Monterey County is the bus service provided by Monterey- Salinas Transit ("MST"). All MST buses are wheelchair accessible and equipped with bike racks. MST bus route 29 between Salinas and Watsonville travels along U.S. 101 in the vicinity of the Project. The closest bus stop is located on Vierra Canyon Road, approximately two (2) miles from the Project site. A Park & Ride lot is approximately three (3) miles from the Project site at Prunedale South Road and Meridian Spur. In addition to MST Route 29, the Prunedale Park & Ride lot also provides connections to MST Routes 28 (Watsonville-Salinas), 55 (Monterey-San Jose Express) and 86 (King City-San Jose/San Jose Airport).

4.13.2.3 Existing Bicycle and Pedestrian Facilities

The Transportation Agency for Monterey County ("TAMC") Bicycle and Pedestrian Master Plan (2011) identifies existing and proposed bicycle facilities that provide access to major employers, shopping centers and schools. There are currently no designated bicycle facilities provided in the vicinity of the Proposed Project. However, the following Monterey County Bikeways Projects in the vicinity of the Proposed Project have been identified in the TAMC Bicycle and Pedestrian Master Plan:

Proposed Class II Bike Lanes[2]:

- Cross Road between Reese Circle and Pesante Road (Tier 3)
- Blackie Road between U.S. 101 and SR 183 (Tier 2)

Proposed Class III Bike Routes[3]:

- Reese Circle-Country Meadows Road between Blackie Road and Damian Way (Tier 2)
- Pesante Road between U.S. 101 and Cross Road (Tier 2)

Tier 2 and Tier 3 bicycle projects are expected to be constructed within the next ten and twenty years, respectively.

The Project site is located in a rural area with limited pedestrian facilities. A pedestrian crosswalk is provided across Pesante Road at the Prunedale Elementary School driveway, approximately one-quarter mile east of U.S. 101.

4.13.3 TRAFFIC IMPACT ANALYSES & METHODOLOGY

This EIR includes an evaluation of potential Level of Service ("LOS") related impacts associated with the Proposed Project, as well as an evaluation of potential Vehicle Miles Traveled ("VMT") related impacts. At that time that the County initiated preparation of this EIR, the applicable standard for traffic related effects was based on the LOS concept. Subsequently, the CEQA Guidelines and Public Resources Code established new criteria for determining the significance of transportation impacts under CEQA. The revised CEQA Guidelines, which went into effect on July 1, 2020, replaced the congestion-based significance metrices (e.g., LOS) with VMT as the basis for determining significant impacts. This EIR includes an evaluation of LOS related impacts as well as potential VMT impacts since the County of Monterey relies on LOS for determining consistency with applicable General Plan policies. Below is a summary of the previous LOS based analysis prepared by Keith Higgins, PE, TE, in 2017, as well as a supplemental VMT analysis prepared by Higgins in 2021.

La Tourette Subdivision Traffic Impact Analysis (October 2017)

In October 2017, Keith Higgins, Traffic Engineer, on behalf of the Applicant, prepared a traffic impact analysis, that analyzed the Proposed Project's potential traffic impacts on the local roadways and intersections. This traffic impact analysis evaluated the Proposed Project's potential traffic-related effects on study intersections and potentially affected roadway segments based on the LOS concept. Higgins developed the scope of the TIA in coordination with the County of Monterey Public Works, Facilities, & Parks Department ("Public Works"). Public Works separately reviewed the TIA to confirm that it adequately addressed potential traffic-related effects associated with the Project. The TIA evaluated potential impacts to 11 study intersections and 12 roadway segments, as more thoroughly described below.

[2] Bike lane (Class II) - A lane on a regular roadway, separated from the motorized vehicle right-of-way by paint striping, designated for the exclusive or semi-exclusive use of bicycles. Bike lanes allow one-way bike travel. Through travel by motor vehicles or pedestrians is prohibited, but crossing by pedestrians and motorists is permitted.
[3] Bike route (Class III) - Provides shared use of the roadway with motorists, designated by signs or permanent markings.

The TIA evaluated the following intersections:

- North King Road / Woodland Heights Place
- North King Road / Pesante Road
- Cross Road / Pesante Road
- NB U.S. 101 / Pesante Road
- Prunedale South Road / Blackie Road
- SB U.S. 101 / Blackie Road
- Reese Circle / Cross Road
- Reese Circle / Prunedale South Road
- Pollock Lane / Pesante Road
- NB U.S. 101 / Reese Circle
- Pollock Lane / Cross Road / Cunha Lane

The TIA evaluated the following roadway segments:

- U.S. 101 between U.S. 156 and Pesante Road
- U.S. 101 between Pesante Road and Sala Road
- U.S. 101 between Sala Road and Boronda Road
- Blackie Road between Prunedale South Road and U.S. 101
- Prunedale South Road between Blackie Road and Reese Circle
- Reese Circle between Prunedale South Road and Cross Road
- Cross Road between Reese Circle and Pollock Lane
- Cross Road between Pollock Lane and Pesante Road
- Pesante Road between U.S. 101 and Cross Road
- Pesante Road between Cross Road and North King Road
- North King Road north of Pesante Road
- Reese Circle between U.S. 101 and Cross Road

The traffic study evaluated traffic conditions under the four following scenarios:

- Existing Conditions
- Existing plus Project Conditions
- Cumulative Without Project Conditions[4]
- Cumulative plus Project Conditions

The traffic analysis evaluated traffic conditions at the study intersections based on a LOS evaluation. LOS is a qualitative measure of operational conditions ranging from A to F. LOS A represents free-flow traffic with little or no delay and LOS F represents highly congested conditions with what is commonly considered unacceptable delay to vehicles.

The Northbound U.S. 101/Pesante Road, Southbound U.S. 101/Blackie Road, and Northbound U.S. 101/Reese Circle intersections were evaluated using the HCS analysis software based on Highway Capacity Manual ("HCM") 2010 methodologies for freeway merge and diverge areas. Merge/diverge operations are

[4] Cumulative Without Project traffic volumes are based on the 2030 Cumulative Conditions scenario within the 2010 Monterey County General Plan. The 2030 Cumulative Without Project traffic volumes include traffic generated by other projects proposed along the Pesante Road corridor.

based on density in passenger cars per mile per lane ("pc/mi/ln"). LOS descriptions for merge and diverge areas are shown in **Table 4.13-2**.

Table 4.13-2
LOS Criteria for Merge and Diverge Segments

LOS	Density (pc/mi/ln)	Comments
A	≤ 10	Unrestricted operations
B	> 10 – 20	Merging and diverging maneuvers noticeable to drivers
C	> 20 – 28	Influence area speeds begin to decline
D	> 28 – 35	Influence area turbulence becomes intrusive
E	> 35	Turbulence felt by virtually all drivers
F	Demand exceeds capacity	Ramp and freeway queues form

Source: Highway Capacity Manual, 2010

The Prunedale South Road/Blackie Road intersection was evaluated using the Synchro analysis software based on HCM 2010 methodologies for signalized intersections. Intersection operations are based upon the average vehicular delay at the intersection. The average delay is then correlated to a level of service. When using the HCM 2010 method for the analysis of signalized intersections, the overall intersection delay is used to determine LOS. LOS descriptions for signalized intersections are shown in **Table 4.13-3**.

Table 4.13-3
HCM 2010 Signalized Intersection Level of Service Definitions

LOS	Description
A	Very low control delay, up to 10 seconds per vehicle and V/C ratio no greater than 1.0. Typically assigned when the V/C ratio is low and either progression is extremely favorable or the cycle length is very short. If due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
B	Control delay greater than 10 and up to 20 seconds per vehicle and V/C ratio no greater than 1.0. Typically assigned when the V/C ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.
C	Control delay greater than 20 and up to 35 seconds per vehicle and V/C ratio no greater than 1.0. Typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
D	Control delay greater than 35 and up to 55 seconds per vehicle and V/C ratio no greater than 1.0. Typically assigned when the V/C ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
E	Control delay greater than 55 and up to 80 seconds per vehicle and V/C ratio no greater than 1.0. Typically assigned when the V/C ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
F	Control delay exceeds 80 seconds per vehicle or V/C ratio greater than 1.0. Typically assigned when the V/C ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

V/C = volume to capacity ratio
Source: Highway Capacity Manual, 2010

Operations for the remaining study intersections were evaluated using the Synchro analysis software based on HCM 2010 methodologies for one- and two-way stop-controlled intersections. Only the side street approaches

must stop at one- or two-way stop-controlled intersections before entering the intersection; traffic on the major street is allowed to pass freely through the intersection. Therefore, the side-street delay (and corresponding level of service) is the criteria used to evaluate the intersection. LOS descriptions for one- and two-way stop-controlled intersections are identified in **Table 4.13-4** below.

Table 4.13-4
HCM 2010 Unsignalized Intersection with Two-Way Stop Control ("TWSC")
Level of Service Definitions

LOS	Control Delay (seconds/vehicle)
A	Very low control delay, up to 10 seconds per vehicle for each movement subject to delay.
B	Control delay greater than 10 and up to 15 seconds per vehicle for each movement subject to delay.
C	Control delay greater than 15 and up to 25 seconds per vehicle for each movement subject to delay.
D	Control delay greater than 25 and up to 35 seconds per vehicle for each movement subject to delay.
E	Control delay greater than 35 and up to 50 seconds per vehicle for each movement subject to delay.
F	Control delay exceeds 50 seconds per vehicle for each movement subject to delay.

Source: Highway Capacity Manual, 2010

The following study segments were evaluated using the HCS analysis software based on HCM 2010 methodologies for basic freeway segments: U.S. 101 between US 156 and Pesante Road, US 101 between Pesante Road and Sala Road, and U.S. 101 between Sala Road and Boronda Road. LOS for freeway segments is based on density in passenger vehicles per mile per lane (pc/mi/ln). The LOS criteria for freeway segments are identified in **Table 4.13-5** below. The remaining study segments, all of which are County road segments, were evaluated based on the 2010 Monterey County General Plan threshold volumes.

Table 4.13-5
HCM 2010 Freeway Segments
Level of Service Definitions

LOS	Density (pc/mi/ln)
A	≤ 11
B	> 11 – 18
C	> 18 – 26
D	> 26 – 35
E	> 35 – 45
F	Demand exceeds capacity > 45

Source: Highway Capacity Manual, 2010

Existing Intersections. For a typical weekday, the traffic study evaluated existing traffic conditions at 11 study intersections during AM and PM peak hours. The peak periods observed were 7:00-9:00 a.m. and 4:00-6:00 p.m., respectively. The study intersections are presented in **Figure 4.13-1**. Weekday AM and PM peak hour turning movement counts were collected at the study intersections in April and June 2016, and May and August 2017. See **Appendix L** for the traffic count data. The following intersections were counted when local schools were not in session:

- Cross Road/Pesante Road;
- Reese Circle/Cross Road;
- Reese Circle/Prunedale South Road;
- NB U.S. 101/Reese Circle; and,
- Pollock Lane/Cross Road/Cunha Lane.

The following intersections were counted when schools were in session:

- North King Road/Woodland Heights Place;
- North King Road/Pesante Road;
- NB U.S. 101/Pesante Road;
- Prunedale South Road/Blackie Road;
- SB U.S. 101/Blackie Road; and,
- Pollock Lane/Pesante Road.

In order to account for traffic conditions during the school year at all study intersections, the traffic analysis balanced the traffic volumes where appropriate with the counts conducted during the school year.

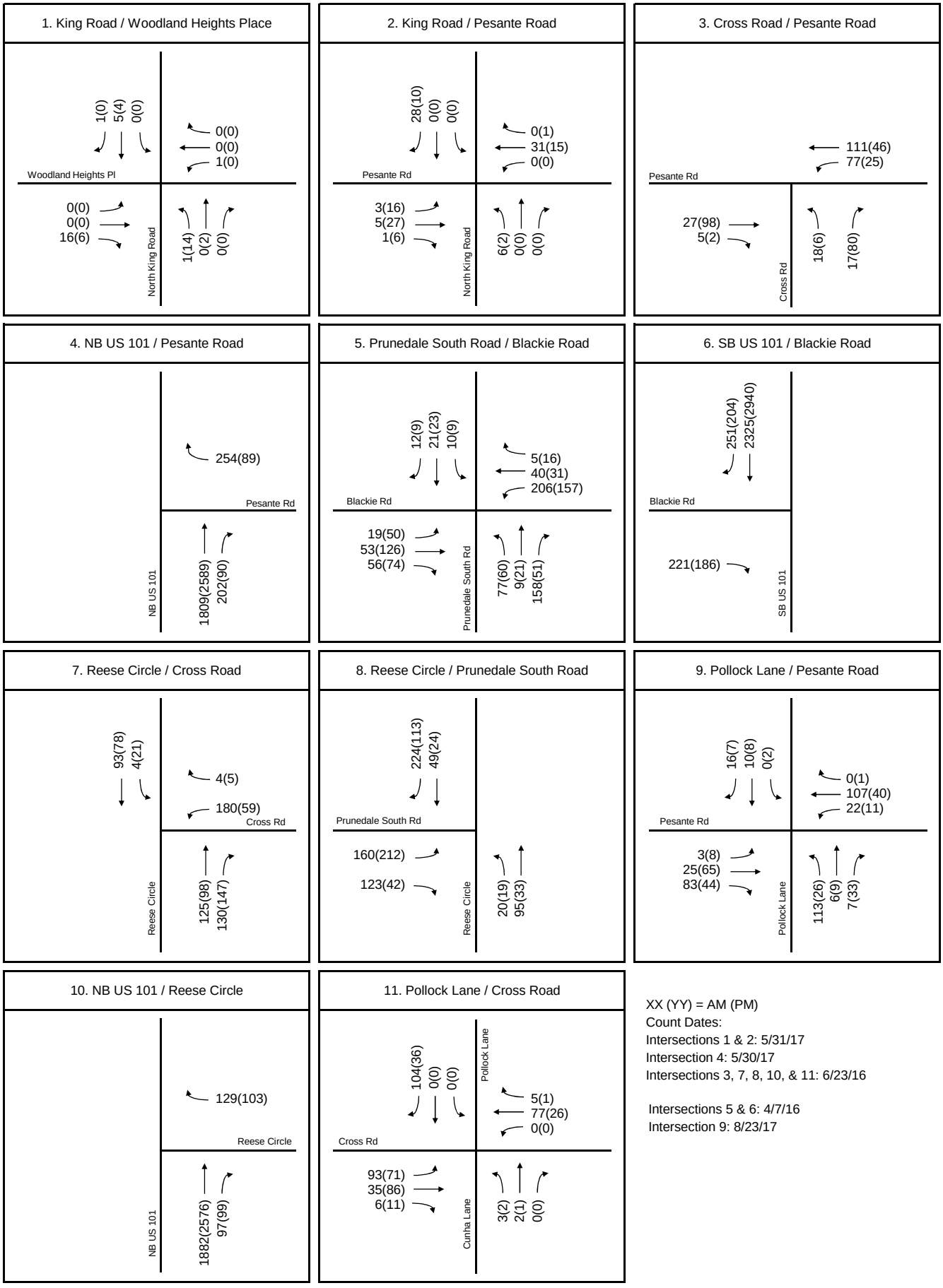
Existing conditions peak hour traffic volumes are presented in **Figure 4.13-2**. As indicated in **Table 4.14-6**, all of the study intersections operate at acceptable levels of service under existing conditions. Intersection levels of service are summarized in **Table 4.13-3.** LOS calculation worksheets are included in Appendix C of the TIA.

The Pesante Road / North King Road intersection has been analyzed assuming stop control on the North King Road approach. However, a stop sign is currently not provided.

Table 4.13-6
Existing Level of Service at Study Intersections

N-S Street	E-W Street	Existing Intersection Control	LOS Standard	Existing Conditions Density or Delay AM Peak Hour	Existing Conditions Density or Delay PM Peak Hour	Existing Conditions LOS AM Peak Hour	Existing Conditions LOS PM Peak Hour
King Road	Woodland Heights Place	Uncontrolled	D	8.7	8.5	A	A
King Road	Pesante Road	Two-way stop	D	9.1	9.2	A	A
Cross Road	Pesante Road	One-way stop	D	10.2	9.3	B	A
NB US 101	Pesante Road	Merge-Diverge	C/D	22.6	25.8	C	C
Prunedale South Road	Blackie Road	Signal	D	17.0	14.6	B	B
SB US 101	Blackie Road	Merge-Diverge	C/D	25.6	27.0	C	C
Reese Circle	Cross Road	One-way stop	D	12.1	11.3	B	B
Reese Circle	Prunedale South Road	One-way stop	D	9.5	9.6	A	A
Pollock Lane	Pesante Road	Two-way stop	D	13.3	10.1	B	B
NB US 101	Reese Circle	Merge-Diverge	C/D	17.9	23.4	B	C
Pollock Lane	Cross Road	Two-way stop	D	12.2	10.9	B	B

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.
Notes:
1. L, T, R = Left, Through, Right
2. NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound
3. For merge-diverge analysis, density is in passenger cars per mile per lane (pc/mi/ln).
4. For signalized intersection analysis, delay is average overall delay in seconds per vehicle (sec/veh).
5. For one- and two-way stop analysis, delay (sec/veh) shown is for worst approach.
6. Analysis performed using 2010 Highway Capacity Manual methodologies.
7. LOS highlighted in red indicates intersection or merge/diverge area operating below level of service standard.



XX (YY) = AM (PM)
Count Dates:
Intersections 1 & 2: 5/31/17
Intersection 4: 5/30/17
Intersections 3, 7, 8, 10, & 11: 6/23/16

Intersections 5 & 6: 4/7/16
Intersection 9: 8/23/17

Existing Conditions Peak Traffic Volumes	Date 6/16/2022	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 4.13-2

Existing Road Segment Operations. Weekday AM and PM peak hour traffic volumes on the study road segments were calculated based on the peak hour intersection counts at segment endpoints. Historic and current ADT volumes for the U.S. 101 study segments were obtained from the Caltrans Traffic Census Program website for the years 2001 to 2015 (http://www.dot.ca.gov/trafficops/census/). A review of the Caltrans data shows that the traffic volumes on these segments of U.S. 101 experienced a downward trend between 2007 and 2009 and only slightly increased between 2009 and 2015. The study segments on U.S. 101 generally operate as a 4-lane freeway. The U.S. 101 study segments were thus analyzed as basic freeway segments using the new peak hour count data to provide an updated and detailed analysis of the U.S. 101 study segments for Existing Conditions. All the study segments operate at acceptable levels of service under Existing Conditions. Road segment volumes and levels of service are summarized in **Table 4.13-7**.

Table 4.13-7
Road Segment Levels of Service

#	Roadway Segment From	Roadway Segment To	Roadway Type	Direction	LOS Standard	Volume AM Peak	Density AM Peak	LOS AM Peak	Volume PM Peak	Density PM Peak	LOS PM Peak
1	US 101	Highway 156/ Pesante Rd	4-Lane Freeway	NB	C/D	2,063	18.9	C	2,678	23.5	C
1	US 101	Highway 156/ Pesante Rd	4-Lane Freeway	SB	C/D	2,577	23.5	C	3,120	25.7	C
2	US 101	Pesante Rd/ Sala Rd	4-Lane Freeway	NB	C/D	2,013	17.0	B	2,697	21.0	C
2	US 101	Pesante Rd/ Sala Rd	4-Lane Freeway	SB	C/D	2,578	20.2	C	3,150	24.6	C
3	US 101	Sala Rd/Boronda Rd	4-Lane Freeway	NB	C/D	1,915	15.1	B	2,743	20.4	C
3	US 101	Sala Rd/Boronda Rd	4-Lane Freeway	SB	C/D	2,607	20.6	C	2,984	23.7	C
4	Blackie Rd	Prunedale S. Rd/ US 101	2-Lane Other Road	Two-way	D	472	0.492	D	390	0.406	D
5	Prunedale S. Rd	Blackie Rd/ Reese Circle	2-Lane Other Road	Two-way	D	527	0.549	D	386	0.402	D
6	Reese Circle	Prunedale S. Rd/ Cross Rd	2-Lane Other Road	Two-way	D	528	0.550	D	382	0.398	D
7	Cross Rd	Reese Circle/ Pollock Lane	2-Lane Other Road	Two-way	D	318	0.331	C	232	0.242	C
8	Cross Rd	Pollock Lane/ Pesante Rd	2-Lane Other Road	Two-way	D	117	0.122	C	113	0.118	C
9	Pesante Rd	US 101/ Cross Rd	2-Lane Other Road	Two-way	D	456	0.475	D	190	0.198	C
10	Pesante Rd	Cross Rd/ North King Rd	2-Lane Other Road	Two-way	D	232	0.242	C	249	0.259	C
11	North King Rd	North of Pesante Rd	2-Lane Other Road	Two-way	D	31	0.032	C	27	0.028	C
12	Reese Circle	US 101/ Cross Rd	2-Lane Other Road	Two-way	D	226	0.235	C	202	0.210	C

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.
Notes:
1. Density is in passenger cars per mile per lane (pc/mi/ln)
2. V/C – Volume to Capacity Ratio
3. LOS – Level of Service
4. LOS highlighted in red indicates segment operating below level of service standard.
5. V/C for segments 3 through 10 calculated based on an LOS E capacity of 960 vehicles per hour for two-way traffic, assuming 10% of the 9,600 ADT LOS E capacity reported in the General Plan EIR.

Site Access. Existing access to the site is currently provided via an existing dirt road that includes access from the existing Woodland Heights residential subdivision. Secondary access is also available from an existing dirt access road off North King Road. The primary internal access to the residential lots would be via a 22-foot wide private road that would extend to the existing Woodland Heights Place. The Project will also have a 13-foot wide emergency access road that will extend to North King Road and will also provide access to two of the residential lots. Another 13-foot wide road within the subdivision will provide access to up to four lots.

2021 Proposal for La Tourette Subdivision Traffic Impact Analysis

In December 2021, Keith Higgins, PE, TE, prepared a supplemental traffic analysis to include an evaluation of potential VMT impacts associated with the Proposed Project. As part of that analysis, Higgins conducted a trip generation study to determine anticipated trip generation rates based on the travel patterns associated with two (2) adjacent rural residential subdivisions. Higgins concluded that trip generation from these subdivisions would be representative of anticipated future traffic associated with the Proposed Project on the basis that these subdivisions are the same parcel size, total unit count, and housing type as the Proposed Project. Higgins further concluded that trip characteristics would be comparable since they have similar socio-economic and geographic characteristics as the Proposed Project. **Table 4.13-8** summarizes the residential trip generation rates for the Woodland Heights and Moonglow Subdivisions and identifies average daily traffic trips per residence.

Table 4.13–8
Pesante Road Single Family Residential Trip Generation Rates

Location	Total No. of Homes	Wed Trips In*	Wed Trips Out*	Wed Trips Total*	Thurs Trips In**	Thurs Trips Out**	Thurs Trips Total**	Daily Mid-Week Avg In	Daily Mid-Week Avg Out	Daily Mid-Week Avg Total	Daily Avg Trips Per Home
Woodland Heights	23	87	88	175	84	86	170	86	87	173	7.50
Moonglow Road	14	65	62	127	56	50	106	61	56	117	8.32
Total	37	152	150	302	140	136	276	146	143	289	7.81

* Trip data collected on 10/31/2021
**Trip data collected 10/14/2021
Source: La Tourette Subdivision Traffic Impact Analysis, 2021. Prepared by Keith Higgins, Traffic Engineer.

As shown in **Table 4.13-8** the Woodland Heights subdivision generated an average of 7.50 trips per day per home. The Moonglow subdivision generated an average of 8.32 trips per day per home. The weighted average of the two subdivisions is 7.81 trips per day per home.[5] The weight average was subsequently applied to the Proposed Project to estimate anticipated average trips associated with the Proposed Project. **Table 4.13-9** below shows anticipated trip generation for the Proposed Project when applying the average daily trip rate for the two (2) adjacent subdivisions.

[5] While the weighted average is less than the standard daily trip rate of 9.44 in "Trip Generation Manual," Institute of Transportation Engineers, 10th Edition, 2017 and the daily rate of 9.43 in the "Trip Generation Manual," Institute of Transportation Engineers ("ITE"), 11th Edition, 2021, this trip rate is within the range of 4.45 to 22.61 daily trips per unit in the ITE database. The County of Monterey HCD-Engineering Services reviewed this trip generation rate and concluded that it was reasonable to use for the Proposed Project.

Table 4.13-9
La Tourette Subdivision Trip Generation Estimates*

Project Description	Project Size (Units)	Daily Trip Rate	Daily Trip Increase
A. Original Subdivision Proposal	19	7.81	N/A
B. Minus Lots with Existing Development	2	N/A	N/A
Original Potential New Home Sites	17	7.81	133

* Daily Trips Based on Woodland Heights and Moonglow Subdivision Trip Rates
Source: La Tourette Subdivision Traffic Impact Analysis, 2021. Prepared by Keith Higgins, Traffic Engineer.

Higgins subsequently compared anticipated trips associated with the Proposed Project against OPR's recommended screening thresholds for small projects to determine whether the Proposed Project would have a significant transportation impact. OPR's *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018) identifies that projects that generate or attract fewer than 110 trips per day are presumed to cause a less-than-significant traffic impact. As discussed further below, the Proposed Project would exceed OPR's recommended threshold for small projects and would, therefore, constitute a significant impact for the purposes of this analysis. Due to the rural nature of the Proposed Project, there are no feasible mitigation measures to reduce the extent of potential VMT-related effects to a less-than-significant level.

4.13.4 REGULATORY ENVIRONMENT

4.13.4.1 State

California Department of Transportation ("Caltrans"). Caltrans is responsible for constructing, enhancing, and maintaining the state highway and interstate freeway systems. As a result, any change to the state roadway system requires an encroachment permit from Caltrans. Work that requires movement of oversized or excessive load vehicles on highway facilities requires a transportation permit by Caltrans.

In addition to maintaining highways and general regulations and laws dealing with licensing, traffic signage, and other noncommercial driver requirements, state laws and regulations also govern motor carriers on roadways within the state.

Senate Bill 743 ("SB 743"). SB 743 establishes criteria for determining the significance of transportation impacts using a VMT metric intended to promote the reduction of GHG emissions, the development of multimodal transportation networks, and a diversity of land uses. SB 743 was enacted in 2013 and became effective in July 2014. It requires OPR and the Natural Resources Agency to amend the CEQA Guidelines through developing criteria for determining the way transportation impacts are measured in California for new development projects, making sure they are built in a way that allows Californians more options to drive less (Pub. Res. Code Sec. 21099(b).). Specifically, SB 743 requires analysis of VMT in determining the significance of transportation impacts.

4.13.4.2 Local

Transportation Agency for Monterey County. The Transportation Agency of Monterey County is an independent association of local officials who oversee planning and funding of regional transportation improvements throughout Monterey County. The agency prepares the Regional Transportation Plan and oversees the implementation of its recommended improvements.

TAMC and its member jurisdictions have adopted a county-wide, regional impact fee to cover the costs for studies and construction of many improvements throughout Monterey County. This impact fee, which went into effect on August 27, 2008, is applied to all new development within Monterey County. The governing document for the fee is the Regional Impact Fee Nexus Study Update (March 26, 2008) prepared by Kimley-Horn Associates, Inc. The Regional Impact Fee Nexus Study Update was updated again in 2013.

TAMC Measure X Transportation Safety and Investment Plan. Measure X was approved by the voters of Monterey County in November 2016. It is anticipated to generate an estimated $20 million annually for a total of $600 million over thirty years through a retail transactions and use tax of a three-eighths' of one-percent (3/8%). The revenue from the sales tax measure will be used to fund transportation safety and mobility projects in Monterey County. Projects will be implemented in North Monterey County along the San Miguel Canyon Road – Hall Road corridor (County Road G-12) and construction of the Highway 156/Castroville Boulevard interchange near Castroville. This sales tax measure will leverage additional state and federal funds to expand the total funding available for transportation improvements in the County.

Association of Monterey Bay Area Governments. AMBAG prepares studies, plans, and policy and action recommendations that may be incorporated into regulatory documents. In addition to its transportation planning and study functions and policy recommendations, AMBAG develops and maintains a regional travel demand forecasting model used to plan regional transportation facilities and assess development proposals.

Monterey County 1982 General Plan. The County of Monterey General Plan provides policies to regulate traffic and transportation throughout the County. Please refer to **Table 4.10-4** of the **Land Use, Population, and Housing** section for a detailed analysis of the Project's consistency with the County's General Plan and Area Plan traffic and transportation policies. Relevant policies are listed below:

37.2.1 Transportation demands of proposed development shall not exceed an acceptable level of service for existing transportation facilities unless appropriate increases in capacities are provided for.

37.4.1 The County shall encourage overall land use patterns which reduce the need to travel.

37.4.2 The County shall encourage the provision, where feasible, of bicycle and automobile storage facilities to be used in conjunction with public transportation.

37.5.1 The design and location of new development shall consider and incorporate provisions for appropriate transportation modes.

38.1.5 Adequate traffic capacity shall be a criterion for development consideration.

39.1.4 New development shall be located where there is existing road and highway capacity or where adequate road and highway capacity will be provided.

39.2.1 All new road and interior circulation systems shall be designed, developed, and maintained according to adopted County standards.

39.2.5 Driveways, mid-block access points, intersections, and on-street parking shall be limited along major roads and highways, where possible.

39.2.6 Pedestrian and bicycle paths shall be separated from major roads and highways, where appropriate, and also shall be provided between adjacent communities, where appropriate.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the region. The North County Area Plan provides policies to regulate traffic and transportation throughout North County. Please refer to **Table 4.10-5** of the **Land Use, Population, and Housing** section for a detailed analysis of the project's consistency with the NCAP's traffic and transportation policies. Relevant policies are listed below:

39.4.4 (N.C.) Access points and intersections accommodating significant and regular flows of truck traffic to or from principal arterials should have appropriate measures taken to prevent unsafe disruptions to traffic flows.

4.13.5 IMPACTS AND MITIGATION MEASURES

4.13.5.1 Thresholds of Significance

A project impact would be considered significant if the project would:

a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities; or

b. Conflict or be inconsistent with CEQA Guidelines Sec. 15064.3, subdivision (b); or

c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or

d. Result in inadequate emergency access.

4.13.5.2 Areas of No Impact

Some of the significance criteria outlined above (a) are not applicable to the Proposed Project, or the Proposed Project would not result in impacts related to these criteria, as explained below. The impact analyses related to the other criteria (b, c, and d) are addressed below under **Section 4.13.5.7 Impact Analysis.**

a. *Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.* The Project is a proposed rural subdivision and does not include public transportation, bicycle, or other pedestrian facilities. No impact would occur.

4.13.5.3 Impact Analysis

CEQA Guidelines Sec. 15064.3(b) provides considerations for evaluating a project's transportation impacts. More specifically, CEQA Guidelines Sec. 15064.3(b)(1) identifies that land use projects shall be evaluated based on VMT. "Generally, projects within one-half miles of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease VMT in the project area compared to existing conditions should be presumed to have a less than significant transportation impact." As a result, the following analysis specifically evaluates whether the

Proposed Project would result in a potentially significant VMT-related effect. While the following impact analysis specifically evaluates the Proposed Project's effects based on current CEQA standards, the following includes a summary of the LOS based analysis conducted as part of the *La Tourette Subdivision Traffic Impact Analysis* (October 2017). This information is included for informational purposes only.

La Tourette Subdivision Traffic Impact Analysis (October 2017) – Impact Summary

Existing + Project Conditions. The Proposed Project would incrementally increase traffic in connection with the introduction of new residential uses. The Project is a standard 19-lot single-family subdivision. The Project is estimated to generate 181 daily trips, with 14 occurring during the AM peak hour (4 in, 10 out) and 19 occurring during the PM peak hour (12 in, 7 out). The trip generation for the Proposed Project was estimated based on the Institute of Transportation Engineers' Trip Generation handbook, 9th Edition, 2012. The project trip generation estimate is provided in **Tables 4.13-10a** and **4.13-10b**.

Table 4.13-10a
Trip Generation – Per Dwelling Unit

Land Use	Land Use Code	Daily Trip Rate	AM Peak Hour Rate	AM Peak Hour % of ADT	AM Peak Hour % In	AM Peak Hour % Out	PM Peak Hour Rate	PM Peak Hour % of ADT	PM Peak Hour % In	PM Peak Hour % Out
Single-Family Detached Housing	210	9.52	0.75	8%	25%	75%	1.00	11%	63%	37%

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.

Table 4.13-10b
Trip Generation – By Proposed Use

Proposed Use	Project Size	Daily Trips	AM Peak Hour Rate	AM Peak Hour % of ADT	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour Rate	PM Peak Hour % of ADT	PM Peak Hour In	PM Peak Hour Out
La Tourette Subdivision	19	181	14	8%	4	10	19	11%	12	7

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.

Based on the analysis contained in the traffic impact analysis, 55 percent of Project trips were assigned to the north via U.S. 101 and 50 percent were assigned to the south via U.S. 101 and the Country Meadows Road connection to Harrison Road. **Table 4.13-11** below shows existing LOS at the study intersections and anticipated future conditions with the Project. As shown in **Table 4.13-11,** all study intersections would continue to operate at an acceptable level of service with the contribution of Project generated traffic.

Table 4.13-11
Level of Service for Existing and Project Conditions

Study Intersection	N-S Street	E-W Street	Existing Conditions LOS AM	Existing Conditions LOS PM	Project Conditions LOS AM	Project Conditions LOS PM
1	King Road	Woodland Heights Place	A	A	A	A
2	King Road	Pesante Road	A	A	A	A
3	Cross Road	Pesante Road	B	A	B	A
4	NB U.S. 101	Resante Road	C	C	C	C
5	Prunedale South Road	Blackie Road	B	B	B	B
6	SB U.S. 101	Blackie Road	C	C	C	C
7	Reese Circle	Cross Road	B	B	B	B
8	Reese Circle	Prunedale South Road	A	A	A	A
9	Pollock Lane	Pesante Road	B	B	B	B
10	NB U.S. 101	Reese Circle	B	C	C	C
11	Pollock Lane	Cross Road	B	B	B	B

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.

The Proposed Project would not adversely affect any of the study intersections or study road segments. As described above, the Project would incrementally increase traffic associated with the introduction of new residential uses. The traffic impact analysis included recommendations to address LOS related impacts associated with the Proposed Project. Although an LOS impact does not constitute a significant impact for the purposes of CEQA, the following improvement would be implemented as part of the Proposed Project as a condition of approval:

- Prior to the recordation of the Final Map, the Applicant shall submit improvement plans that include the installation of off-site improvements on the North King Road approach to Pesante Road. The project shall include the installation of a stop sign with limit line and "Stop" pavement legend on the North King approach to Pesante Road. A W1-7 Two-Direction Large Arrow Sign should also be considered on the far side of the intersection. All off-site improvements plans shall be submitted to the Public Works for review and approval prior to the recordation of the Final Map. All off-site improvements shall be installed prior to the issuance of any grading or building permit for the construction of new residential units.

Cumulative + Project Conditions. The traffic impact analysis identified anticipated cumulative conditions without the Project to determine the existing cumulative scenario. This scenario was based on the 2030

cumulative conditions scenario[6]. In addition, the cumulative scenario considered five (5) approved or pending projects that were located within a five-mile radius of the Project. Two of those projects are located along the Pesante Road corridor. The traffic impact analysis estimated anticipated AM and PM peak hour traffic volumes generated by the cumulative projects are identified in **Tables 4.13-12a** and **4.13-12b** below.

Table 4.13-12a
Trip Generation of Cumulative Project – Per Dwelling Unit

Land Use	Land Use Code	Daily Trip Rate	AM Peak Hour Rate	AM Peak Hour % of ADT	AM Peak Hour % In	AM Peak Hour % Out	PM Peak Hour Rate	PM Peak Hour % of ADT	PM Peak Hour % In	PM Peak Hour % Out
Single-Family Detached Housing	210	9.52	0.75	8%	25%	75%	1.00	11%	63%	37%

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.

Table 4.13-12b
Trip Generation of Cumulative Project – By Proposed Use

Proposed Use	Project Size	Daily Trips	Peak Hour Trips	AM Peak Hour % of ADT	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour Trips	PM Peak Hour % of ADT	PM Peak Hour In	PM Peak Hour Out
Charolais Ranch Subdivision	26	248	20	8%	5	15	26	11%	16	10
Whitehead Subdivision	6	57	5	9%	1	4	6	11%	4	2
Bradshaw Subdivision	10	95	8	8%	2	6	10	11%	6	4
Catherine Estates	28	267	21	8%	5	16	28	11%	18	10
Butterfly Village	-	13,334	866	6%	265	609	1,389	10%	811	578
Total Cumulative Projects		14,000	920	7%	287	650	1,459	10%	855	604

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.

The traffic impact analysis subsequently calculated anticipated AM and PM peak hour traffic under the cumulative Project scenario to determine whether any of the study intersections or roadway segments would operate at an unacceptable level of service. **Table 4.13-13** identifies the anticipated level of service for the study intersections under the cumulative project scenario. As identified in **Table 4.13-13,** the following intersections would operate at an unacceptable level of service:

[6] The 2017 LaTourette Subdivision Traffic Impact Analysis evaluated cumulative impacts without project conditions based on 2030 cumulative conditions within the 2010 Monterey County General Plan.

- NB U.S. 101/Pesante Road – LOS E (AM) and LOS F (PM)
- SB U.S. 101/Blackie Road – LOS F (AM and PM)
- NB U.S. 101/Reese Circle – LOS D (AM) and LOS F (PM)

Table 4.13-13
Level of Service for Existing and Cumulative without Project Conditions

Study Intersection	N-S Street	E-W Street	Existing Conditions LOS AM	Existing Conditions LOS PM	Cumulative without Project Conditions LOS AM	Cumulative without Project Conditions LOS PM
1	King Road	Woodland Heights Place	A	A	A	A
2	King Road	Pesante Road	A	A	A	A
3	Cross Road	Pesante Road	B	A	B	A
4	NB U.S. 101	Resante Road	C	C	E	F
5	Prunedale South Road	Blackie Road	B	B	B	B
6	SB US 101	Blackie Road	C	C	F	F
7	Reese Circle	Cross Road	B	B	B	B
8	Reese Circle	Prunedale South Road	A	A	A	A
9	Pollock Lane	Pesante Road	B	B	A	A
10	NB U.S. 101	Reese Circle	B	C	D	F
11	Pollock Lane	Cross Road	B	B	B	B

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.

The TIA also identified the anticipated level of service for the study roadway segments under the cumulative scenario (see **Table 4.13-14**). All of the study roadway segments are projected to operate at acceptable levels of service under the cumulative without project scenario with the exception of U.S. 101. As identified in **Table 4.13-14**, the following segments would operate at an unacceptable LOS:

- NB U.S. 101 between SR 156 and Pesante Rd – LOS E (AM) and LOS F (PM)
- SB U.S. 101 between SR 156 and Pesante Rd – LOS F (AM and PM)
- NB U.S. 101 between Pesante Rd and Sala Rd – LOS D (AM) and LOS F (PM)
- SB U.S. 101 between Pesante Rd and Sala Rd – LOS E (AM) and LOS F (PM)
- NB U.S. 101 between Sala Rd and Boronda Rd – LOS D (AM) and LOS F (PM)
- SB U.S. 101 between Sala Rd and Boronda Rd – LOS F (AM and PM)

Table 4.13-14
Road Segment Levels of Service for Existing and Cumulative without Project Conditions

#	Roadway Segment From	Roadway Segment To	LOS Standard	Direction	Existing Conditions AM Peak LOS	Existing Conditions PM Peak LOS	Cumulative without Project Conditions AM Peak LOS	Cumulative without Project Conditions PM Peak LOS
1	U.S. 101	Highway 156/ Pesante Rd	C/D	NB	C	C	E	F
1	U.S. 101	Highway 156/ Pesante Rd	C/D	SB	C	C	F	F
2	U.S. 101	Pesante Rd/ Sala Rd	C/D	NB	B	C	D	F
2	U.S. 101	Pesante Rd/ Sala Rd	C/D	SB	C	C	E	F
3	U.S. 101	Sala Rd/ Boronda Rd	C/D	NB	B	C	D	F
3	U.S. 101	Sala Rd/ Boronda Rd	C/D	SB	C	C	F	F
4	Blackie Rd	Prunedale S. Rd/ U.S. 101	D	Two-way	D	D	D	D
5	Prunedale S. Rd	Blackie Rd/ Reese Circle	D	Two-way	D	D	D	D
6	Reese Circle	Prunedale S. Rd/ Cross Rd	D	Two-way	D	D	D	D
7	Cross Rd	Reese Circle/ Pollock Lane	D	Two-way	C	C	C	C
8	Cross Rd	Pollock Lane/ Pesante Rd	D	Two-way	C	C	C	C
9	Pesante Rd	U.S. 101/ Cross Rd	D	Two-way	D	C	D	C
10	Pesante Rd	Cross Rd/ North King Rd	D	Two-way	C	C	D	C
11	North King Rd	North of Pesante Rd	D	Two-way	C	C	D	C
12	Reese Circle	U.S. 101/ Cross Rd	D	Two-way	C	C	D	C

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.

As demonstrated above, several intersections and roadway segments would operate at an unacceptable level of service without the Project. The TIA subsequently added the traffic generated by the Project incremental to the cumulative project scenario to determine the extent to which the project would contribute to a cumulative effect. Under the Cumulative Plus Project scenario, the intersections identified below would continue to operate below their level of service standard (**Table 4.13-15**).

- NB U.S. 101/Pesante Road – LOS E (AM) and LOS F (PM)
- SB U.S. 101/Blackie Road – LOS F (AM and PM)
- NB U.S. 101/Reese Circle – LOS D (AM) and LOS F (PM)

Table 4.13-15
Level of Service for Existing and Cumulative with Project Conditions

Study Intersection	N-S Street	E-W Street	Existing Conditions LOS AM	Existing Conditions LOS PM	Cumulative with Project Conditions LOS AM	Cumulative with Project Conditions LOS PM
1	King Road	Woodland Heights Place	A	A	A	A
2	King Road	Pesante Road	A	A	A	A
3	Cross Road	Pesante Road	B	A	B	A
4	NB U.S. 101	Resante Road	C	C	E	F
5	Prunedale South Road	Blackie Road	B	B	B	B
6	SB U.S. 101	Blackie Road	C	C	F	F
7	Reese Circle	Cross Road	B	B	B	B
8	Reese Circle	Prunedale South Road	A	A	A	A
9	Pollock Lane	Pesante Road	B	B	B	B
10	NB U.S. 101	Reese Circle	B	C	D	F
11	Pollock Lane	Cross Road	B	B	B	B

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.

According to the traffic impact analysis, the level of service at these intersections increases through traffic on U.S. 101. The incremental increase in traffic-trips associated with the Proposed Project represents a negligible increase in overall traffic volumes on U.S. 101. The TIA identified that "the project's impact is inconsequential in light of the overall volumes on 101." The Project would add five (5) AM and four (4) PM peak-hour trips at the NB U.S. 101/Pesante Road intersection and four (4) AM and three (3) PM peak hour trips at the SB U.S. 101/Blackie Road intersection. The Project's contribution to the NB U.S. 101/Reese Circle intersection would not be measurable. The addition of Project trips would be negligible in comparison to the approximately 2,000 AM and 2,500 PM peak hour trips in the northbound direction and 2,500 AM and 3,000 PM peak hour trips in the southbound direction.

In addition to the above listed intersections, the following roadway segments identified below would also operate at an unacceptable level of service (**Table 4.13-16**).

- NB U.S. 101 between SR 156 and Pesante Rd – LOS E (AM) and LOS F (PM)
- SB U.S. 101 between SR 156 and Pesante Rd – LOS F (AM and PM)
- NB U.S. 101 between Pesante Rd and Sala Rd – LOS D (AM) and LOS F (PM)
- SB U.S. 101 between Pesante Rd and Sala Rd – LOS E (AM) and LOS F (PM)
- NB U.S. 101 between Sala Rd and Boronda Rd – LOS D (AM) and LOS F (PM)

- SB U.S. 101 between Sala Rd and Boronda Rd – LOS F (AM and PM)

Table 4.13-16
Road Segment Levels of Service for Existing and Cumulative with Project Conditions

#	Roadway Segment From	Roadway Segment To	LOS Standard	Direction	Existing Conditions AM Peak LOS	Existing Conditions PM Peak LOS	Cumulative with Project Conditions AM Peak LOS	Cumulative with Project Conditions PM Peak LOS
1	U.S. 101	Highway 156/ Pesante Rd	C/D	NB	C	C	E	F
1	U.S. 101	Highway 156/ Pesante Rd	C/D	SB	C	C	F	F
2	U.S. 101	Pesante Rd/ Sala Rd	C/D	NB	B	C	D	F
2	U.S. 101	Pesante Rd/ Sala Rd	C/D	SB	C	C	E	F
3	U.S. 101	Sala Rd/ Boronda Rd	C/D	NB	B	C	D	F
3	U.S. 101	Sala Rd/ Boronda Rd	C/D	SB	C	C	F	F
4	Blackie Rd	Prunedale S. Rd/ U.S. 101	D	Two-way	D	D	D	D
5	Prunedale S. Rd	Blackie Rd/ Reese Circle	D	Two-way	D	D	D	D
6	Reese Circle	Prunedale S. Rd/ Cross Rd	D	Two-way	D	D	D	D
7	Cross Rd	Reese Circle/ Pollock Land	D	Two-way	C	C	D	C
8	Cross Rd	Pollock Lane/ Pesante Rd	D	Two-way	C	C	C	C
9	Pesante Rd	U.S. 101/ Cross Rd	D	Two-way	D	C	D	C
10	Pesante Rd	Cross Rd/ North King Rd	D	Two-way	C	C	D	C

#	Roadway Segment From	Roadway Segment To	LOS Standard	Direction	Existing Conditions AM Peak LOS	Existing Conditions PM Peak LOS	Cumulative with Project Conditions AM Peak LOS	Cumulative with Project Conditions PM Peak LOS
11	North King Rd	North of Pesante Rd	D	Two-way	C	C	D	C
12	Reese Circle	U.S. 101/ Cross Rd	D	Two-way	C	C	D	C

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.

The incremental increase in Project generated traffic on the study roadway segments would also represent a negligible increase in overall traffic volumes on the affected roadway segments. For instance, the Project would add five (5) AM and four (4) PM peak-hour trips along the NB U.S. 101 between SR 156 and Pesante Road. In comparison, existing traffic volumes on this segment during the AM and PM peak hour are 3,569 and 4,576, respectively. Project-generated traffic's contribution would be comparable along the other affected roadway segments as shown in **Table 4.14-16.** The Project's contribution of traffic trips would be negligible in comparison to existing traffic volumes on the affected roadway segments.

While the Project's incremental increase in traffic would be negligible, the Project would still add additional traffic on existing intersections and roadway segments that would operate at an unacceptable level of service under the cumulative plus project scenario. The traffic impact analysis included recommendations to address LOS related impacts associated with the Proposed Project. Although an LOS impact does not constitute a significant impact for the purposes of CEQA, the following recommendations would be implemented as part of the Proposed Project as a condition of approval:

- Prior to the recordation of the Final Map, the Applicant shall submit payment of the Transportation Agency of Monterey County ("TAMC") Regional Impact Fee to mitigate the project's contribution to cumulative impacts. The Applicant shall pay the impact fee that is in effect at the time of Final Map recordation. The Applicant shall submit evidence to the County of Monterey Housing and Community Development Department documenting compliance with this measure prior to the recordation of the Final Map.
- Prior to the recordation of the Final Map, the Applicant shall submit payment of the Countywide Traffic Impact Fee. The Applicant shall pay the required impact fee that is in effect at the time of Final Map recordation. The Applicant shall submit evidence to the County of Monterey Housing and Community Development Department documenting compliance with this measure prior to the recordation of the Final Map.
- Prior to the recordation of the Final Map, the Applicant shall submit payment of the Pesante Road Corridor Fee. The Applicant shall pay the required impact fee that is in effect at the time of Final Map recordation. The Applicant shall submit evidence to the County of Monterey Housing and Community Development Department documenting compliance with this measure prior to the recordation of the Final Map.

Project Access. The introduction of new residential units would result in an increase in traffic trips on the existing access road serving the existing Woodland Heights Residential subdivision. Existing access to the site

would be adequate except for two (2) existing private driveways that do not have adequate design capacity to accommodate Project generated traffic.

The traffic impact analysis evaluated potential traffic-related effects associated with the proposed access to the Project site. Access between the Project site and Pesante Road would be provided via North King Road, Woodland Heights, and Woodland Heights Court. These segments of North King Road are designed either to Private Tertiary Rural Sidehill Road standards on hilly terrain or Private Tertiary Rural Road standards on level terrain. These segments currently serve 42 homes or less. The estimated daily traffic volumes on these segments is 400 or less. The traffic impact analysis evaluated potential impacts to each of these roads by segments to determine whether these segments had sufficient volume to accommodate site access. **Table 4.13-17** includes a summary of those findings.

Table 4.13-17
Project Access Road Analysis

Access Road	Road	County Road Type	Allowable Max. Number of Homes	Allowable Max. Daily Traffic	Required Width	Provided Width	Existing No. of Homes Served	Existing ADT	Existing Plus Project No. of Homes Served	Existing Plus Project ADT	Comment
A. North King Road	Pesante Rd. to Moonlight Ct.	Private Tertiary Rural Road	100	1,000	20 ft.	20 ft.	42	420	61	610	Acceptable with Project
A. North King Road	Moonglow Rd. to Woodland Heights Place	Private Tertiary Rural Road	100	1,000	20 ft.	20 ft.	30	290	49	490	Acceptable with Project
B. Woodland Heights Place	North King Road to Security Gate	Private Tertiary Rural Sidehill Road	100	1,000	22 ft.	22 ft.	24	240	43	430	Acceptable with Project
B. Woodland Heights Place	North of Security Gate	Private Tertiary Rural Sidehill Road	100	1,000	22 ft.	22 ft.	23	230	42	420	Acceptable with Project
B. Woodland Heights Place	South of Woodland Heights Court	Private Tertiary Rural Sidehill Road	100	1,000	22 ft.	22 ft.	13	130	32	320	Acceptable with Project
C. Woodland Heights Lane	West of Woodland Heights Place	Private Tertiary Rural Sidehill Road	100	1,000	22 ft.	22 ft.	6	60	6	60	Acceptable with Project
D. Woodland Heights Court	Woodland Heights Pl. to End of Cul-de-Sac	Private Tertiary Rural Sidehill Road	100	1,000	22 ft.	22 ft.	7	70	26	260	Acceptable with Project

Access Road	Road	County Road Type	Allowable Max. Number of Homes	Allowable Max. Daily Traffic	Required Width	Provided Width	Existing No. of Homes Served	Existing ADT	Existing Plus Project No. of Homes Served	Existing Plus Project ADT	Comment
D. Woodland Heights Court	End of Cul-de-Sac to 8620 Woodland Heights Ct.	Private Common Driveway	4	40	12 ft.	12 ft.	1	10	20	200	Requires Widening to 22 ft. Private Tertiary
D. Woodland Heights Court	8620 Woodland Heights Ct. to Project Boundary	Private Common Driveway					0	0	19	190	Requires Widening to 22 ft. Private Tertiary

Source: La Tourette Subdivision Traffic Impact Analysis, 2017. Prepared by Keith Higgins, Traffic Engineer.

As shown in **Table 4.13-17,** the Proposed Project would increase the number of daily traffic trips between the Project site and Pesante Road via North King Road, Woodland Heights, and Woodland Heights Court. More specifically, the Project would increase traffic volumes on Woodland Place by a maximum of 430 vehicles/day. The Project would increase the number of existing homes served by Woodland Place from 24 residences to 43 residences. However, the increase in average daily traffic trips on Woodland Place would not exceed the Private Tertiary Sidehill Road allowable threshold of 1,000 vehicles per day. Moreover, it would also not exceed the maximum allowable number of homes threshold of 100 dwelling units. Similarly, the Proposed Project would also increase traffic volumes on North King Road. As identified above, average daily traffic trips on North King Road would increase from 420 vehicles per day to 610 vehicles per day. However, the increase in average daily traffic trips would not exceed the threshold of 1,000 vehicles per day for a Private Tertiary Rural Road. As a result, access to the Project site via North King Road and Woodland Heights Place would not exceed applicable thresholds warranting the implementation of mitigation measures.

While the Proposed Project would not increase average daily traffic trips on Woodland Heights Place or North King Road beyond allowable maximum daily traffic trips. The Proposed Project would increase average daily traffic trips beyond acceptable standards on Woodland Heights Court. More specifically, the Project would exceed allowable maximum daily traffic trips at the following locations: the end of Cul-de-Sac to 8620 Woodland Heights Court and 8620 Woodland Heights to the Project boundary. Both locations are classified as a "Private Common Driveway." The Proposed Project would increase average daily traffic trips at these locations by 190 daily trips. Both locations require widening to accommodate site access. More specifically, both locations should be widened to meet the standards for a Private Tertiary Road. The implementation of these improvements would ensure that adequate site access is available to accommodate project-generated traffic. The following improvement would be implemented as part of the Proposed Project as a condition of approval:

- Prior to the recordation of the Final Map, the Applicant shall submit Subdivision Improvement Plans that include widening the existing common driveway that extends from the Woodland Court Cul-de-Sac bulb to the project boundary from its existing 12-foot width to 22 feet to comply with the County of Monterey Tertiary Rural Sidehill Road standard. All Subdivision Improvement Plans shall be subject to the review and approval of the County of Monterey HCD-Engineering Services.

Impact TR-1: The Proposed Project would increase the extent of residential development on-site as compared to existing, pre-project, conditions. This would result in an increase in daily traffic trips associated with new residential uses. VMT associated with the Proposed Project would exceed OPR's small project screening threshold. This represents a significant and unavoidable impact. Due to the rural nature of the Proposed Project, there are no feasible mitigation measures available that would reduce this impact to a less than significant level. (Criterion b)

CEQA Guidelines Sec. 15064.3, subdivision (b)(1) calls for the evaluation of transportation impacts of projects based on VMT. CEQA uses the VMT metric to evaluate a project's transportation impacts. Monterey County does not currently have any adopted VMT standards. In the absence of a County adopted threshold of significance, this EIR relies on OPR's recommended small project screening threshold to determine whether the Proposed Project's VMT effects would be significant. For the purposes of this analysis, the Proposed Project would result in a significant traffic-related effect if the Project would exceed 110 daily trips.

The Proposed Project would result in the development of a 19-lot residential subdivision. As identified elsewhere in this EIR, the site is currently improved with three (3) existing residences (mobile homes), which would be demolished as part of the Proposed Project. As a result, the Proposed Project would result in the net increase of 16 new residence on-site as compared to existing, pre-project, conditions. The introduction of new residential uses on-site would generate additional traffic that could exceed OPR's recommended small project screening threshold.

As discussed above, Higgins prepared a supplemental traffic analysis to evaluate the potential VMT related impacts associated with the Proposed Project (**Appendix M**). As part of that analysis, Higgins conducted a trip generation study to determine anticipated trip generation rates based on the travel patterns associated with adjacent rural residential development, including the Woodland Heights and Moonglow Subdivisions. **Table 4.13-8** summarizes above the residential trip generation rates for the Woodland Heights and Moonglow Subdivisions and identifies average daily traffic trips per residence. As shown in **Table 4.13-8** the Woodland Heights subdivision generated an average of 7.50 trips per day per home. The Moonglow subdivision generated an average of 8.32 trips per day per home. The weighted average of the two subdivisions is 7.81 trips per day per home.[7] **Table 4.13-9** above shows anticipated trip generation for the Proposed Project when applying the average daily trip rate for the two (2) adjacent subdivisions.

As identified in **Table 4.13-9,** the Proposed Project would generate approximately 133 new daily traffic trips (excluding trips associated with the existing residences). Anticipated traffic trips associated with the Proposed Project would exceed OPR's recommended small project screening threshold of 110 daily trips. Due to the Proposed Project's rural location, there are no feasible mitigation measures to reduce potential VMT impacts associated with the Proposed Project below OPR's recommended small project screening threshold. **Therefore, the Proposed Project would have a significant and unavoidable VMT-related impact.**

Significance: Significant and Unavoidable.

Mitigation: None.

[7] While the weighted average is less than the standard daily trip rate of 9.44 in "Trip Generation Manual," Institute of Transportation Engineers, 10th Edition, 2017 and the daily rate of 9.43 in the "Trip Generation Manual," Institute of Transportation Engineers ("ITE"), 11th Edition, 2021, this trip rate is within the range of 4.45 to 22.61 daily trips per unit in the ITE database. The County of Monterey Public Works, Facilities, & Parks Department reviewed this trip generation rate and concluded that it was reasonable to use for the Proposed Project.

Impact TR-2: The Proposed Project would potentially result in a traffic-related design hazard if Project generated truck traffic would be unable to safely maneuver through the Blackie Road intersection without encroaching into opposing traffic lanes. This is a less than significant impact. No mitigation measures are necessary. (Criterion c)

The Proposed Project would not substantially increase hazards due to a design feature due to the introduction of Project-generated truck traffic maneuvering through the Blackie Road intersection. For the purposes of this analysis, the Project would substantially increase an existing design hazard if truck traffic cannot safely maneuver through the existing Blackie Road intersection without encroaching into opposing traffic lanes. Blackie Road is diagonally oriented at its intersections with Prunedale South Road and U.S. 101. The design of the Blackie Road intersection creates skewed intersections that can make it difficult for large trucks to perform turning movements. For the reasons provided below, project generated truck traffic would not encroach into opposing traffic lanes. Therefore, this represents a less-than-significant impact.

The 2017 traffic impact analysis included a geometric analysis of the Black Road/Prunedale South Road and Blackie Road/Southbound U.S. 101 intersections to ensure that Project-generated truck traffic would be able to safely maneuver those intersections. Each of the intersections is analyzed separately below.

- **Prunedale South Road/Blackie Road Intersection**. The traffic impact analysis included truck turning templates for the northbound right-turn and westbound left-turn movements at the Prunedale South Road/Blackie Road intersection. Higgins subsequently used the turning templates to determine the largest truck-tractor combinations that could perform these movements without encroaching into opposing lanes of traffic or onto the paved shoulders. The templates were prepared using WB-40, California Legal-50, and STAA-Standard truck types. Based on the results of the traffic impact analysis, all three truck types are able to safely maneuver through the Prunedale South Road/Blackie Road intersection without encroaching into opposing traffic lands. There would be little to no encroachment onto the paved shoulders.
- **Southbound U.S. 101/Blackie Road Intersection**. Higgins also prepared truck turning templates for the southbound right-turn movement at the U.S. 101/Blackie Road intersection. Higgins used the turning templates to determine the largest truck-tractor combinations that could perform these movements without encroaching into opposing lanes of traffic, guardrails, or onto the paved shoulders. The templates were also prepared using WB-40, California Legal-50, and STAA-Standard truck types. Based on the results of the traffic impact analysis, WB-40 trucks can maneuver through the SB U.S. 101/Blackie Road without encroaching into opposing lanes of traffic and with only a slight encroachment onto the paved shoulder. The analysis further identified that California Legal-50 and STAA-standard trucks encroach into the opposing lane of traffic and onto the paved shoulder, and STAA-standard trucks also extend beyond the paved shoulder.

As discussed above, the traffic impact analysis included a geometric analysis of the Blackie Road intersection with Prunedale South Road and Southbound U.S. 101. The geometric analysis considered truck turning movements for WB-40, California Legal-50, and STAA Standard truck types. As discussed in the traffic impact analysis, the project is not anticipated to generate heavy-truck trips associated with these vehicle types. Truck trips associated with the construction of the Project are anticipated to include 3-axle dump trucks, 3-axles dump trucks with full pull trailers, or 2-axles trucks pulling doubles. None of these vehicles are longer than the WB-40. Moreover, upon completion of construction, the Proposed Project would not generate substantial truck

traffic. As a result, the Proposed Project would not substantially increase hazards due to a design feature due to the introduction of Project-generated truck traffic maneuvering through the Blackie Road intersection. This is considered a less than significant impact. No mitigation measures are necessary.

Significance: Less than Significant.

Mitigation: None.

Impact TR-3: The Proposed Project would increase traffic due to the introduction of new residential uses on the site. The Proposed Project would not, however, result in inadequate emergency access. No mitigation measures are necessary. (Criterion d)

Implementation of the Proposed Project would result in creation of a 19-lot residential subdivision that may require emergency vehicles to access the site. The Proposed Project does not, however, include any elements that would impede and/or otherwise obstruct emergency vehicle access. All internal roadways would be designed to comply with applicable County of Monterey roadway standards, which will ensure that emergency vehicles will be able to access the site. Moreover, the North County Fire Protection District's review of final roadway improvement plans would ensure that final design of the internal access roadway network would be able to accommodate emergency vehicle. Finally, the Proposed Project also includes a secondary access point to ensure emergency vehicles can access the site. This represents a less than significant impact. No mitigation measures are necessary.

Significance: Less than Significant.

Mitigation: None.

4.13.6 REFERENCES

Keith Higgins, Traffic Engineer. 2021. *La Tourette Subdivision Traffic Impact Analysis, Monterey County, CA*. Dated December 2021.

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County of Monterey. 1985. *North County Area Plan and Amendments*. Adopted July 1985.

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California Office of Planning and Research, December 2018. Technical Advisory on Evaluating Transportation Impacts in CEQA.

Hexagon Transportation Consultants, Inc. 2007. *La Tourette Subdivision Final Traffic Report*. Dated February 2007.

4.14 WASTEWATER DISPOSAL

4.14.1 INTRODUCTION

This section, completed by Questa Engineering Corporation ("Questa"), addresses the potential wastewater disposal impacts associated with the Proposed Project. Specifically, this section addresses applicable wastewater disposal requirements and feasibility of onsite wastewater disposal. Questa based this evaluation on the review of Project plans, regulatory guidelines, and requirements. Additionally, Questa evaluated the results of onsite soils, groundwater and percolation testing, and other relevant environmental data for the Project area. This section also addresses the potential impacts on groundwater-nitrate concentrations in the Project area based on the results of a nitrate loading analysis prepared by Questa. **Table 4.14-1** summarizes the anticipated environmental effects of the Project, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.14.4, Impacts and Mitigation Measures**.

Table 4.14-1
Summary of Wastewater Disposal Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measures	Residual Impact
WWD-1	The Proposed Project could have soils incapable of adequately supporting the use of onsite septic systems. However, Project site evaluation has determined adequate soil and site characteristics.	Potentially Significant	WWD-1a WWD-1b	Less than significant
WWD-2	The Proposed Project could result in potential significant impacts to water quality as a result of construction and operation. Furthermore, the Proposed Project could result in discharge that would substantially contribute to groundwater contamination or contamination of public water supply.	Less than significant	None	Less than significant

4.14.2 ENVIRONMENTAL SETTING

The 47.57-acre Project site is situated on the south-facing slopes of Pesante Creek Canyon. Elevations on the site range from 390 feet above mean sea level ("msl") along the southern edge of the property on proposed Lot 4, to 560 feet above msl on the north end of the property on proposed Lot 17. The topography is predominantly rolling hills, with slopes ranging from about 8 to 25 percent. Most of the site is grassland with stands of pine, oak and madrone trees, manzanita and other brush making up the balance of the site. There are no defined streams or watercourses on the property; the site drains to the south through two (2) prominent broad swales.

The subsurface conditions at the Project site are described in the Preliminary Geologic and Geotechnical Report prepared for the proposed development (HKA, 2004). According to the study, the Project site is underlain by eolian deposits of the Aromas Sand, with fingers of surficial colluvial deposits filling the two flat-bottomed drainages. The eolian deposits are comprised of fine to medium-grained, well-sorted sand containing varying amounts of silt and clay. The colluvium filling the drainage swales is comprised of very loose to loose, well sorted fine to medium grained sand containing varying amounts of silt.

The United States Department of Agriculture ("USDA") Soil Conservation Service ("SCS") have mapped site soils as Arnold Loamy Sand and Arnold-Santa Ynez Complex. Arnold Loamy Sand is mapped over the two-flat bottomed drainages; the ridges that form the drainage boundaries at the site are mapped as Arnold-Santa Ynez complex. The Arnold soil series consists of somewhat excessively drained soils that formed on hills and uplands in old marine sand dunes or in materials weathered from soft sandstone. Arnold soils generally have rapid permeability, medium runoff, and a moderate risk of erosion.

Presently, the Project site is largely undeveloped, with three residential structures located in the area of proposed Lots 2, 11 and 18. The existing residences obtain their water supply from a well located in the southeast corner of the site and utilize onsite septic systems for wastewater disposal. Under the Proposed Project these residences will be removed; and the septic systems will be replaced with new facilities installed under County permit requirements. The existing water well will remain; however, it will no longer be used for domestic supply; it will be used for irrigation and other non-potable needs only. The Proposed Project will utilize individual septic systems for 19 new residences on parcels ranging in size from 1.17 to 5.30 acres.

4.14.3 REGULATORY REQUIREMENTS

Onsite sewage disposal in Monterey County is governed by County ordinances and regulations in conjunction with policies and guidelines of the Central Coast Regional Water Quality Control Board and the State Water Resources Control Board. The Environmental Health Bureau ("EHB") is responsible for implementing County requirements related to septic disposal through the issuance of onsite wastewater treatment system ("OWTS"), also referred to as septic system) permits. The requirements for installation and use of OWTS are contained in Monterey County Code (Chapter 15.20 – Sewage Disposal).

The codes and practices in Chapter 15.20 (last update 6/13/23) are in accordance with the County's Local Agency Management Program ("LAMP") for Onsite Wastewater Treatment Systems. The LAMP was developed in response to the State Water Resources Control Board's "Water Quality Control Polity for Siting, Design, Operation and Maintenance of Onsite Wastewater Treatment Systems ("OWTS Policy"), which became effective in May 2013. The County's LAMP, which was approved by the Central Coast Water Board on May 10, 2018, details new regulations and site evaluation requirements that will be applied to any OWTS (septic system) permit issued on or after May 11, 2018.

Some of the notable changes to OWTS requirements included in the LAMP include:

- Specifies more comprehensive site evaluation requirements related to soils, groundwater, and percolation testing;
- Limits the depth of dispersal fields;
- Limits the use of seepage pits;
- Requires septic tank pumpers to submit a report on every septic tank pump out in the County; and
- Allows consideration for alternative OWTS for existing lots of record that are constrained by certain soils, groundwater, or percolation conditions.

With respect to the approval of new subdivisions reliant on OWTS, EHB requirements are generally unchanged from past practices. Each proposed new lot requires demonstration from soils, topography, setbacks, lot

configuration and other information and analysis that the use of an OWTS is feasible in accordance with current standards. Some of the key site requirements applicable to OWTS for new subdivisions are summarized in the discussion below.

4.14.3.1 Soil Depth

The minimum required depth of soil between the dispersal field trench bottom and an impervious layer or bedrock is three (3) feet. This is determined through soil test pits and/or borings in the disposal field area.

4.14.3.2 Percolation Rates

Percolation testing is required to demonstrate rates no slower than one inch/hour (90 min/inch, ("MPI")[1]) for an area to be considered suitable for a leachfield trench system. Percolation rates faster than five (5) MPI require greater depths to groundwater as discussed below. Percolation testing procedures are as approved by the Director (Monterey County Code Section 15.20.080.B.2, and normally include minimum four (4) hours of testing, presoaking of the test holes the day prior to running the tests and, typically, a minimum of three (3) test holes in the dispersal field area. The number of tests may be reduced depending on the uniformity or soil conditions and the results.

4.14.3.3 Depth to Groundwater

For soils with percolation rates between 1 and <5 MPI the vertical distance between trench bottom groundwater is 20 feet; for 5 to 30 MPI, the requirement is eight (8) feet; and for 30 to 90 MPI, the requirement is five (5) feet. OWTS are not permitted on sites where the percolation rate is faster than one (1) MPI for new lot creation; existing lots of record with fast percolation may be developed with the use of an approved alternative (supplemental) treatment unit. The location of the groundwater is determined through soil borings in the dispersal field area.

4.14.3.4 Ground Slope

The maximum acceptable ground slope for the placement of dispersal systems is 30%.

4.14.3.5 Setback Requirements

Minimum requirements for setbacks between OWTS and various key water, building and landscape features are listed in **Table 4.14-2**, based on the approved LAMP. Included are requirements for septic tanks and dispersal fields.

4.14.3.6 Sewage Dispersal System Depth

A dispersal system shall not exceed 10-feet maximum depth unless an alternative OWTS with supplemental treatment system is incorporated into the design, except in areas identified by LAMP Figure 2-10 as Potential Aquifer Recharge Areas, in which a new dispersal system shall not exceed 5-feet maximum depth. New and pending subdivision applications that were not considered complete before May 10, 2018, are prohibited from using seepage pits to demonstrate OWTS feasibility.

[1] MPI is the time, in minutes, for water to drop one (1) inch in a standard percolation test hole.

4.14.3.7 Sewage Dispersal System Sizing

County of Monterey requires a primary dispersal field plus an additional amount of reserve area (or standby area) equal to twice that of the primary disposal field. In other words, there must be sufficient area on the property to accommodate three full dispersal fields, although only two systems (the primary and secondary fields) are required to be installed at initial construction. The minimum sewage dispersal area for both the primary and reserve fields is based on the house size (number of bedrooms) and the trench design. The design flow for a 3-bedroom and 4-bedroom house is 450 gpd. The sizing of the dispersal field is based on soil percolation rates (converted to corresponding wastewater application rates, gpd/ft^2) and trench dimensions (depth and length).

Table 4.14-2
OWTS Horizontal Setback Requirements*

Impact Summary	Septic Tank (feet)	Dispersal Field (feet)
1. Wells, potable, irrigation, monitoring, cathodic protection	100	100[a]
2. Wells, geothermal	50	50
3. Domestic water supplies (that do not serve a public water system)	100	100[a]
4. Public water supply wells (existing)		
Where the dispersal system is less than or equal to 10 feet deep	100[d]	150
Where the dispersal system is deeper than 10 feet and supplemental		
treatment, including disinfection, has been incorporated	100[d]	150
5. Public water system surface water intake		
Where the effluent dispersal system is less than 1,200 feet from a public water system's surface water intake, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies (measured from high water mark of the reservoir, lake, or flowing water body)	100[d]	400
Where the effluent dispersal system is more than 1,200 feet but less than 2,500 feet from a public water system's surface water intake, within the catchment of the drainage, and located such that it may impact water quality at the intake point such as upstream of the intake point for flowing water bodies (measured from high water mark of the reservoir, lake or flowing water body)	100[d]	200
6. Bodies of water: vernal pools, wetlands, lakes, ponds, other surface water bodies	100[d]	200
7. Watercourse: measured from high-water mark	100	100
8. Springs, natural or any part of man-made spring	100	100[a]
9. Drainageway; measured from edge of flow path		
Up slope (when elevation of the bottom of the drainage way is at or above the elevation of the effluent distribution pipe)	25	25
Down slope (when elevation of the bottom of the drainage is below the elevation of the effluent distribution pipe)	25	50
10. Curtain Drains		
Up slope	10	Requires Site Specific Engineering
Down slope	10	50
11. Domestic water line	10	10
12. Building, structure, or mobile home	5	10
13. Property line	5	10
14. Large trees (when diameter of trunk is greater than or equal to 5 inches, measured 2 feet from ground level)	10	10
15. Downhill embankment with change in slope greater than 20% or cut slope	10	4 x H[bc]

Impact Summary	Septic Tank (feet)	Dispersal Field (feet)
16. Steep slopes >50 percent (measured from the break of the slope)		
height of steep slope is less than 12 feet	10	25
height of steep slope is greater than or equal to 12 feet	10	50
17. In-ground swimming pools/spas		
Up slope (when the elevation of the bottom of the pool or spa is at or above the elevation of the OWTS component)	10	10
Down slope	10	25
18. Unstable land mass or areas subject to landslides	100[c]	100[c]

* County of Monterey LAMP for OWTS, May 2018

a The required setback distance for existing seepage pits without supplemental treatment shall not be less than 150 feet.

b H equals the height of cut or embankment, in feet. The required setback distance shall not be more than 50 feet, measured from the distribution pipe.

c This distance may be reduced if recommended by a Geotechnical Report.

d All new or replacement septic tanks, pump tanks and supplemental treatment system tanks will be tested and confirmed to be watertight prior to final inspection; therefore, a 100 feet horizontal setback is adequate to protect public water supply wells, bodies of water and public water system intake points from contamination.

4.14.3.8 Minimum Lot Size

The County's LAMP (Table 5-1, p56), institutes limits on average lot size density for new subdivisions as shown in **Table 4.14-3**:

Table 4.14-3
Allowable Average Densities per Subdivision

Average Annual Rainfall (inches per year)	Allowable Density (acres per single family dwelling or equivalent)
0 – 15	2.5
>15 – 20	2
>20 – 25	1.5
>25	1

Additionally, the LAMP requires that new subdivisions comply with the following limits based on estimated nitrogen contributed to groundwater from OWTS (Table 5-2 in the LAMP):

Table 4.14-4
Minimum Lot Size and Estimated Nitrogen Loading

# of Bedrooms	Estimated Nitrogen Loading (grams per day)	Minimum Lot Size When a Water Well Does Not Exist on the Site (acres)
1	20	1
2	30	1
3	40	1
4	50	1.25
5	60	1.5
6	70*	1.75

* see Table 5-2 in the LAMP for more information.

4.14.3.9 Cumulative Wastewater Loading

Cumulative wastewater loading impacts on surface water and/or groundwater resources from OWTS may occur due factors such as wastewater constituent levels (e.g., nitrogen), overall volume of wastewater discharge, high density of OWTS in a given area, or presence of sensitive environmental resources.

Nitrogen is a recognized chemical contaminant associated with onsite sewage disposal systems. County of Monterey LAMP Section 5.2.1 – Cumulative Impact Analysis, requires that new developments proposing to use onsite sewage disposal systems evaluate the expected nitrate-nitrogen impacts on the groundwater resources in the Project area. This is commonly referred to as a nitrate loading analysis. The County requires that the analysis consider existing and proposed future development on the Project site. This analysis is in addition to demonstrating compliance with the lot size criteria above (LAMP, Table 5-2), based on bedroom count and estimated mass loading of nitrogen (grams per day).

A rise in the water table, referred to as "groundwater mounding" is another potential cumulative wastewater loading concern, which may occur beneath or down-gradient of OWTS discharges as a result of the concentrated or high volume of wastewater from one or more systems in a concentrated area.

4.14.4 IMPACT AND MITIGATION MEASURES

4.14.4.1 Thresholds of Significance

In accordance with the State CEQA Guidelines, County requirements, and agency and professional standards, a Project impact may be considered significant if the Project would:

a. have soils incapable of adequately supporting the use of onsite septic systems where sewers are not available for the disposal of wastewater; or

b. substantially degrade water quality; or

c. proposed discharge will substantially contribute to groundwater contamination or contaminate a public water supply.

4.14.4.2 Methodology

Subsurface conditions at the Project site have been investigated by three (3) consultants. The results were subsequently used by a separate consultant who prepared lot-by-lot analysis and septic system plans for the Project. The following summarizes the chronology and results from this work.

Project Site Field Investigations and Septic System Plans. Subsurface conditions, a lot-by-lot analysis, and septic system plans were evaluated by four (4) consultants. The following summarizes the chronology and results from this work.

Haro, Kasunich and Associates - 2004

In September 2004, Haro, Kasunich, and Associates ("HKA") completed a preliminary geologic and geotechnical investigation of the Project site (see **Section 4.6, Geology and Soils**, of this EIR). The primary purpose of the HKA analysis was to identify geotechnical and geological issues affecting the Proposed Project

and summarize areas of specific concern. The work included the drilling and logging of twelve boreholes to depths ranging from 16.5 to 26.5 feet below ground surface ("bgs"). HKA concluded that the site is underlain by eolian deposits of the Aromas Sand, with fingers of surficial colluvial deposits filling the two flat-bottomed drainages. HKA reported the eolian deposits were comprised of fine to medium-grained sand containing varying amounts of silt, becoming very dense, and/or cemented at varying depths throughout the site. All boreholes were dry with the exception of one located in the southeast corner of the site near the proposed stormwater detention-retention basin (currently proposed Lot 16). Perched groundwater was found at a depth of eight (8) feet bgs at this location.

Questa Engineering Corporation – 2004

In August 2004, Questa Engineering Corporation ("Questa") conducted an investigation of the Project site to evaluate the feasibility of onsite septic disposal. The work involved the drilling and logging of nine (9) boreholes to a depth of approximately 22 feet bgs and completion of 37 percolation tests at different depths and locations throughout the Project site. A representative from the County of Monterey EHB observed Questa's field work.

Soils and Groundwater. The soil boreholes were located near the proposed leachfield sites as preliminarily identified by the Applicant. Questa positioned the boreholes near lot boundaries, usually straddling two (2) lots (i.e., one boring per two lots) to obtain representative information on soils and groundwater conditions throughout the areas planned for onsite sewage disposal. Questa obtained samples at depths of five (5) feet, 10 feet and bottom of hole at each drilling location. The soils were found to be consistently silty sand, with small amounts of clay present in some of the samples. The consistence varied from loose to very dense; some areas showed evidence of cementation.

The soil boreholes were left open for over 24 hours to allow for determination of static water level. No groundwater appeared in any of the nine (9) soil boreholes to the depth of exploration.

Percolation Tests. Questa conducted two (2) percolation tests at each proposed leachfield location identified by the Applicant. The only exceptions were Lot 2, where access was not possible because of heavy brush cover, and Lot 11, which is the location of an existing residence. A shallow and a deep percolation test were run at each location to provide information on possible variation in percolation characteristics with depth. The shallow tests were run at approximately six (6) feet bgs; the deep tests were run at approximately 11 feet bgs. The percolation test results are summarized in **Table 4.14-5**, along with other subsequent tests (discussed below). All lots tested were found to have at least one (1) suitable percolation rates in either the shallow or deep soil test zones, except for Lots 10, 12, 13, and 14. Supplemental, follow-up testing was conducted by the Applicant's consultant, Soil Surveys, Inc., for these four lots and for Lot 2, which had not been tested as noted above.

Table 4.14-5
Percolation Test Data, Proposed Lots 11-19

Lot No.	Questa Eng., 2004 Test No.	Questa Eng., 2004 Depth	Questa Eng., 2004 MPI	Soil Surveys, 2005 Test No.	Soil Surveys, 2005 Depth	Soil Surveys, 2005 MPI	Soil Surveys, 2014 Test No.	Soil Surveys, 2014 Depth	Soil Surveys, 2014 MPI
1	1-P1	5.4	24						
1	1-P2	11.0	13						
2				T-5	12.0	10	P-48	5.2	0.85
2							P-49	7.9	0.65

Lot No.	Questa Eng., 2004 Test No.	Questa Eng., 2004 Depth	Questa Eng., 2004 MPI	Soil Surveys, 2005 Test No.	Soil Surveys, 2005 Depth	Soil Surveys, 2005 MPI	Soil Surveys, 2014 Test No.	Soil Surveys, 2014 Depth	Soil Surveys, 2014 MPI
2							P-50	5.0	1.06
2							P-51	7.0	0.57
2							P-52	12.2	0.43
3	3-P1	5.3	1				P-36	14.0	13.89
3	3-P2	11.8	24				P-37	8.1	43.48
3							P-38	8.0	30.93
4	4-P1	6.6	45	T-6	13.5	60	P-28	7.0	12
4	4-P2	10.4	56				P-29	5.0	3.33
4	4-D1	6.0	>120						
5	5-P1	6.1	6						
5	5-P2	11.0	14						
6	6-P1	5.8	56				P-1	5.0	60
6	6-P2	11.8	100				P-2	7.0	9.50
6							P-66	4.7	7.35
7				T-5	12.0	10	P-43	5.0	0.95
7							P-44	6.5	0.79
7							P-45	11.1	5.10
7							P-46	6.8	0.59
7							P-47	5.0	1.18
8	8-P1	6.5	>120				P-29	5.0	3.33
8	8-P2	11.3	14				P-30	7.0	120
8							P-31	5.0	4.29
8							P-32	7.0	20
8							P-33	12.0	20
8							P-34	5.0	6
8							P-35	12.0	30
9	9-P1	6.3	28						
9	9-P2	11.2	33						
10	7-P1	6.4	25				P-23	5.0	4.3
10	7-P2	11.5	72				P-24	7.0	30.0
10	10-P1	6.0	>120				P-25	7.0	30.0
10	10-P2	10.4	83				P-26	12.0	30.0
10							P-27	5.0	60.0
10							P-28	7.0	12.0

Sources: Questa Engineering, 2004
Soil Surveys, 2005
Soil Surveys, 2014
Soil Surveys, Inc. - 2005

January 2005 - Soil Profiles. In January 2005, Soil Surveys, Inc., excavated and logged the soil conditions in five (5) backhoe test pits, one (1) each on Lots 2, 10, 12, 13, and 14. The depth of the test pits ranged from 10 to 14.5 feet bgs. The work was observed by a representative from the County of Monterey EHB. The soil profile logs for these supplemental test pits indicated primarily sand with varying degrees of silt and some clay in the areas investigated. Sandstone/siltstone "caprock" was found at various depths in each of the five (5) test pits, ranging from about five (5) to 13 feet bgs. Caprock, which is commonly defined as a strata or erosion-resistant sedimentary rock material, is nearly impermeable and unacceptable as a medium for onsite sewage disposal. Below the caprock at each test pit, Soil Surveys, Inc. found more permeable soil conditions and

recommended that the leachfield systems on these five (5) lots be constructed with trenches that extend into and utilize the soil zones below the depth of caprock, at depths ranging from five (5) to 13 feet bgs.

December 2005 - Percolation Tests. Questa's preliminary review of the supplemental soil profile information resulted in a request for additional percolation testing in the recommended locations/soil zones identified in the Soil Surveys, Inc. report. In response to this request, Soil Surveys, Inc. conducted percolation testing on Lots 2, 12, 13 and 14 in December 2005. This testing occurred within the soil zones recommended in their February 2005 soil profile report. The test results are listed in **Table 4.14-5** above, along with the test results from Questa. Follow-up percolation testing and recommendations were not addressed for the leachfield site on Lot 10.

County of Monterey EHB Review. County of Monterey EHB's review of the soils and percolation test results from Questa and Soil Surveys found feasibility problems and/or incomplete information with respect to several of the proposed leachfield sites due to various issues, such as: (1) setbacks to road cuts and detention basin; (2) depth to groundwater in the southeast corner of the subdivision; (3) demonstration of sufficient area for leachfield and replacement area; and (4) proposed reliance on deep leachfield designs. Most significantly, EHB clarified that the Project site was within an area of documented groundwater nitrate contamination and, therefore, subject to the requirements of Monterey County Code which, at the time, dictated the use of only shallow leachfield designs for new lots. Based on EHB's determination, the County requested the Applicant to modify proposed lot configurations and leachfield sites, and to complete supplemental percolation testing to demonstrate on-site septic disposal feasibility. Soil Surveys, Inc. completed the supplemental percolation testing in 2014.

Soil Surveys, Inc. - 2014

May 2014 – Supplemental Percolation Testing. Based on modified lot configuration, Soil Surveys, Inc. bored and prepared sixty-six test holes for percolation testing within the proposed leachfield areas. Soil Surveys, Inc. conducted this work on May 14, 16, and 29, 2014. Four (4) of the 19 original leachfield sites did not require additional testing. Percolation tests were then conducted on the prepared test holes on May 21st, June 12-13, and June 19-20, 2014. All were tested a day after pre-soaking the test holes. Eight (8) test holes were found to have been tampered with and were abandoned after attempts were made to clean them out and properly prepare them. Ten additional test holes were drilled on July 14, 2014, near the abandoned test holes and were prepared for percolation testing the following day. The lot-by-lot percolation test results are provided in **Table 4.14-5** along with the other prior data from work by Questa in 2004 and Soil Surveys, Inc. in 2005.

Taluban Engineering, Inc. - 2020

In 2020, Taluban Engineering, Inc. prepared septic system site plans for each of the 19 lots, along with supporting calculations. The plans show scaled layout of the primary, secondary, and tertiary (reserve) leachfield areas on each lot, along with the plotted location of the numerous percolation tests and soil borings. Leachfield sizing calculations were included on each individual plan sheet, based on percolation test results from the combined work by Questa and Soil Surveys, Inc, utilizing test results representative of the shallow soil zones. The plans indicate a 5-foot maximum leachfield depth for all lots. Nitrogen loading calculations based on bedroom count and lot area were included, demonstrating compliance with criteria in Table 5-2 of the LAMP. **Table 4.14-6** summarizes the recommendations and supporting basis for each lot.

Table 4.14-6
La Tourette Septic System Design Summary, 2020

Lot No.	Lot size (gross area, ac)	Septic Envelope (ft^2)	# of Bedrooms	Trench Length (feet, per field)	Loading Rate (gpd/ft^2)	Design Capacity (gpd)	Percolation Design Basis	N loading limit (grams/day)	N Loading Estimate (grams/day)
1	2.72	6,750	4	190	0.6	456	24 mpi (1-P1)	108.8	50
2	1.39	6,750	4	95	1.2	456	1 mpi (P-50)	55.6	50
3	1.32	6,750	4	285	0.4	456	37 mpi (P-37, 38)	52.8	50
4	5.3	7, 475	4	95	1.2	456	3 mpi (P-29)	212	50
5	2.42	6,750	4	150	0.8	480	6 mpi (5-P1)	96.8	50
6	2.07	6,750	4	570	0.2	456	58 mpi (6-P1, P-1)	82.8	50
7	1.26	6,750	4	95	1.2	456	1 mpi (P-43, P-47)	50.4	50
8	2.10	7,490	4	95	1.2	456	4.5 mpi (P-29,31,34)	84	50
9	1.54	13,700	4	164	0.7	459	17 mpi (9-P1, P-34)	61.6	50
10	1.56	8,600	4	100	1.2	480	4.3 mpi (P-23)	62.4	50
11	2.06	11,850	4	95	1.2	456	3.6 mpi (P-9)	82.4	50
12	1.17	9,750	3	285	0.4	456	40 mpi (P-5)	46.8	40
13	3.68	6,750	4	95	1.2	456	2.5 mpi (P-40, 41)	147.2	50
14	2.63	11,300	4	100	1.2	480	1 mpi (16-P1)	105.2	50
15	1.94	12,330	4	630	0.18	454	62 (P-59, 62)	77.6	50
16	3.7	15,020	4	150	0.8	480	9.4 mpi (P-18, 68)	148	50
17	3.86	8,450	4	100	1.2	480	1.2 mpi (P-57)	154.4	50
18	2.06	6,750	4	164	0.7	459	13 mpi (18-P1)	82.4	50
19	3.48	9,800	4	100	1.2	480	2.23 mpi (P-76)	139.2	50

[1]Per plans by Taluban Engineering, Inc.

EHB Review – 2020

EHB completed their review of the Taluban Engineering, Inc. septic system plans in December 2020, finding continuing septic system feasibility problems with several of the lots, which had been documented in previous letters from EHB to the Applicant (letter of April 8, 2016). Briefly, EHB identified the following septic suitability issues affecting six (6) of the 19 proposed lots:

- Proposed septic envelopes for Lots 2, 7 and 14 exhibit rapid percolation rates, faster than one (1) MPI, which cannot be approved for new subdivision lots; (subsequent review by EHB found the proposed septic envelope for Lot 14 to be acceptable with percolation at the 1 MPI limit).
- Proposed septic envelopes for Lots 8 and 10 are located between septic envelopes for Lots 4 and 9, creating a concentrated discharge area and the potential for groundwater mounding and interference between the adjacent systems.
- Proposed septic envelope for Lot 16 lacks adequate supporting percolation test results and shows indications of high groundwater conditions.

EHB recommended these six (6) proposed lots be merged with other adjacent proposed lots.

EHB also requested that additional information be submitted for all other proposed lots (1, 3, 4, 5, 6, 9, 11, 12, 13, 15, 17, 18, and 19) documenting conformance with groundwater separation requirements as specified in Table 5-6 of the County of Monterey LAMP.

4.14.4.3 Impact Analysis

Impact WWD-1: The Proposed Project could have soils incapable of adequately supporting the use of onsite septic systems. However, Project site evaluation has determined adequate soil and site characteristics, and therefore this represents a less-than-significant impact. (Criterion a).

The Proposed Project could have soils incapable of supporting the use of onsite septic systems. The suitability of the Proposed Project for the use of individual residential septic systems was evaluated by comparing the site conditions to requirements contained in Monterey County Code Section 15.20.080 and in the County's approved LAMP for OWTS. This entailed a review of the areas designated as septic system disposal field areas ("septic envelopes") on the Septic System Site Plans for the 19 proposed lots, prepared by Taluban Engineering, Inc. (dated 6/18/2019 and 2/15/2020), along with supporting soils and percolation testing data for the Project site completed by Questa (2004) and Soil Surveys Inc. (2005, 2015). The review also included calculations and design analysis by Taluban Engineering and various correspondence and review comments by County of Monterey EHB. The following summarizes the review and findings relative to key site suitability and design requirements applicable to the proposed subdivision, all of which relate to assessing the capability to adequately support the use of onsite septic systems.

Ground Slope

All proposed septic disposal sites are in areas having natural ground slopes of less than 30 percent, which is in conformance with County Code Section 15.20, Table 8.

Setbacks to Water Features

The Project site does not contain any watercourses. However, there is an existing water well in the southeast corner of the site that is proposed to remain; and the Project plans include the development of two (2) stormwater detention-retention ponds that would create temporary surface water features. Septic disposal fields would be required to maintain a setback of 100 feet from the well and from both stormwater ponds. All of the proposed septic disposal fields shown on the Septic System Site Plans meet this requirement.

Soil Depth

Soils on the Project site have been explored extensively through drilling and soil profile test pits. Most of the site consists of deep silty sand soils, with small amounts of clay, and varied density. Bedrock was not encountered in any of the soil borings to depths of 22 feet by Questa (2004), and to depths of 26.5 feet by HKA (2004). However, while the soil is sufficiently deep, the site consists of zones of moderate to very dense soils, including some areas of cementation and "caprock." Through testing, re-testing and reconfiguration of lots and septic system leachfield areas, the Applicant has attempted to avoid the areas of "caprock" and dense soils. The observed soil conditions in proposed septic envelopes conform to County leachfield requirements (LAMP Section 5.9.1.1), which specify a minimum depth of three (3) feet of soil below trench bottom, as measured to bedrock or an impervious layer. Percolation testing (discussed below) provides more specific basis for distinguishing the presence of slowly permeable soils and for the selection of appropriate design depth (i.e., effective soil zone) for leachfield systems.

Percolation

The results of percolation testing are listed in **Table 4.14-6** for all proposed lots, including work by Questa (2004) and Soil Surveys, Inc. (2005, 2014). The combined testing includes over 100 percolation tests at numerous depths and locations on the site. The percolation test results along with other siting factors were utilized in making adjustments in lot configuration and formed the basis for leachfield system sizing and Septic System Site Plans prepared for each lot by Taluban Engineering.

Test results included some from rapid (<1 MPI), many in the moderate range, and some very slow (>120 MPI). Overall, most of the test results were in the moderate range of five (5) to 60 MPI. The following categorizes the percolation test results for the proposed lots:

- Suitable Percolation – Lots 1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, and 19.
- Rapid – Lots 2, 7.
- Unsuitable Percolation – Lot 16.

Suitable Percolation. Percolation rates in the range of one (1) to 90 MPI were demonstrated for the following 16 lots: 1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, and 19. These rates are considered suitable for use of onsite wastewater treatment systems and in conformation with County LAMP (Table 5.4). Percolation rate is also a factor in determining the required vertical separation to groundwater below the leachfield, which is discussed separately below.

Rapid Percolation. Rapid percolation rates of ≤1 MPI was found on two of the lots: Lots 2 and 7. Leachfield areas with rapid percolation rates, faster than 1 MPI, are not permitted for new lot creation in Monterey County. For existing lots of record, the County's LAMP allows advanced/supplemental treatment to be included following the septic tank to mitigate the lack of soil treatment in rapidly draining (≤1 MPI) soils. This provision does not extend to creation of new lots. Therefore, the lots with rapid percolation rates cannot be found in to be in conformance with County requirements. This requires that alternate leachfield sites be documented, or that the lots be merged with adjacent lots. An additional option for one of the lots is to consider it as the "remainder/existing" lot of the subdivision, allowing the use of supplemental treatment to mitigate the rapid percolation condition, which is available to existing lots of record.

Unsuitable Percolation. Lot 16 demonstrated slow to failing percolation rates from multiple tests; and no feasible leachfield site has been identified on this lot as determined from soils and percolation testing and review by EHB.

Groundwater Separation

With one exception, groundwater was not encountered in any test pits or borings at the site to depths of 22 to 26.5 feet. The only groundwater found was in Borehole No. 1 by HKA, which was located in the southeast corner of the Project site near the area planned for one of the stormwater detention-retention basins. Groundwater was found at a depth of eight (8) feet bgs at this borehole location. This corresponds to a water table elevation of about 369 feet (above mean sea level). The nearest proposed septic system envelopes (Lots 16 and 19) are more than 250 feet from this location, and at higher elevations, 384 feet and 393 feet, respectively.

Groundwater separation requirements specified in the County of Monterey LAMP (Table 5-6) vary according to soil percolation rates, which vary from lot-to-lot. The Septic System Site Plans and supporting design analysis by Taluban Engineering do not include documentation of conformance with the applicable groundwater separation requirements for each lot, which are summarized in **Table 4.14-7**, by lot and the corresponding design percolation rate used for leachfield sizing:

Table 4.14-7
Groundwater Separation Requirements by Lot[1]

Percolation Rate (MPI)	Minimum Vertical Separation to Groundwater[2]	Applicable Lot #s[3]
≤ 1	Not allowed without supplemental treatment	2, 7
1 to < 5	20 feet	4, 8, 10, 11, 13, 14, 17, 19
5 to $\leq$ 30	8 feet	1, 5, 9, 18
30 to $\leq$ 90	5 feet	3, 6, 12, 15

Source: Taluban Engineering, Inc. 2020
1 From LAMP Table 5-6.
2 Measured from bottom of leaching trench to seasonal high groundwater level.
3 Note: Lot 16 determined by EHB to have inadequate documentation of suitable percolation.

While the Applicant has not provided explicit documentation of groundwater separation data for each proposed leachfield site, there is significant evidence that conformance with the above County requirements will not be problematic for nearly all of the proposed lots. This is based on the following; (1) numerous "dry" boreholes 20 to 25-feet deep found in exploratory work by HKA and Questa; (2) high topographic position of the site, with no identifiable sources of lateral drainage or groundwater flow from surrounding areas; (3) minimal amount of onsite rainfall percolation (average of 3.3" per year) to create and sustain any local groundwater condition of significance; and (4) the significant elevation difference (40 to 130 feet higher elevation) between the proposed leachfield sites and the only observed water table elevation of 369 feet (amsl) by HKA. The only leachfield envelope near the southeast corner of the site at an elevation and location where follow-up evaluation of groundwater separation appears warranted is Lot 16. As discussed above, Lot 16 is also problematic from the standpoint of not having demonstration of suitable percolation.

The vertical separation criteria in LAMP Table 5-6 are based on the presumption that the indicated percolation rate is representative of the soil permeability from the bottom of the leaching trench to the water table. If there are intervening layers of less permeable soils (higher percolation rate) between the leaching trench and water

table, this would normally be a consideration in applying the criteria. For example, if there is evidence of five feet depth of soil having 30 to 90 MPI percolation characteristics beneath a shallow leachfield where the trench zone soils are in the >1 to 5 MPI range, this would be a consideration in determining demonstration of suitable groundwater separation. The objective of the vertical separation to groundwater is to ensure sufficiently long travel time for percolating wastewater to be filtered and treated before reaching the water table.

Available Area for Sewage Disposal

The Septic System Site Plans prepared by Taluban Engineering identifies proposed "septic envelopes" and leachfield design layouts for each lot, which are summarized in **Table 4.14-7**. The septic envelopes vary in size from 6,750 to 15,020 square feet, which vary according to the percolation rates determined for the respective lot. The supporting information provided by the Taluban Engineering includes the design basis and calculations to substantiate the proposed envelopes and leachfield sizing, including the primary, secondary, and tertiary (reserve) leachfields. Calculations and layouts were reviewed by EHB for accuracy, code compliance and to assess whether or not they are of sufficient size to accommodate the expected residential house size on each lot. The proposed leachfield sites were also reviewed to determine their proximity to test areas and for other possible concerns related to construction and/or operation of the proposed leachfields.

The designated sewage disposal areas have been found to be appropriately sited and of sufficient area with the exception of Lots 2, 7 and 16 as discussed above in regard to percolation results. Additionally, EHB has expressed concern and objection to the proposed location of septic envelopes for Lots 8 and 10, which are immediately adjacent to and between the proposed leachfield areas for Lots 4 and 9. The concern is that the clustering of these four leachfields in a concentrated area poses the likelihood of groundwater mounding effects and interference between adjacent leachfields. EHB has recommended against the approval of the proposed septic envelopes for Lots 8 and 10, and either additional testing and relocation of the proposed leachfields or merging of these lots with adjacent lots. In reaching their determination, EHB has cited the drainage conditions, evidence of dense sub-soils and soil mottling suggestive of possible seasonal soil saturation.

The issue posed by the clustering of septic envelopes for 4, 8, 9 and 10 is a cumulative impact concern (groundwater mounding) which is a noted consideration addressed under Section 5.2.1 of the County's LAMP. The combined wastewater discharge from the four (4) separate OWTS would have a design flow rate of 1,800 gpd and an estimated average daily flow of about 800 gpd[2]. The LAMP allows for the EHB to require the completion of a cumulative impact analysis to evaluate and develop recommendations and mitigations, as appropriate for situations such as this. The EHB has not specifically requested completion of cumulative impact assessment and the applicant's consultants have not directly addressed this issue in field studies or design information provided with the proposed Septic System Site Plans. An additional approach acceptable to EHB would be to reconfigure the septic envelopes to maintain a minimum 50-foot horizontal setback distance between adjacent parcel septic envelopes (in all directions). Preliminary review indicates this is feasible for the group of lots in question.

[2] Based on 200 gpd per residence used in the water balance analysis, **Appendix K**.

Conclusion

The availability of sufficient land area with suitable soils, percolation, and groundwater conditions to support the use of individual residential septic systems has been demonstrated for all proposed lots with the following exceptions:

a) Three lots having problematic percolation test results - Lots 2 and 7 with rapid percolation rates <1 MPI, and Lot 16, where suitable rates were not achieved; and

b) Lots 8 and 10 which are clustered adjacent to proposed leachfield sites for Lots 9 and 4, posing potential cumulative groundwater mounding issues that could interfere with long-term system operation.

Therefore, the Proposed Project could result in potentially significant impacts related to rapid/unsuitable percolation and the potential groundwater mounding due to clustering of leachfield septic envelopes. **These potential impacts would be reduced to less than significant with implementation of the mitigation measures below.**

Significance: Less-than Significant with Mitigation.

Mitigation:

Mitigation Measure WWD-1a:

Prior to the recordation of the final map, the Applicant shall submit a revised final map to the HCD-Planning and County of Monterey – EHB, that merges lots 2, 7, and 16 with adjacent lots having suitable soils. In this configuration the merged lot could be identified as "existing," which would allow the use of an alternative OWTS to mitigate rapid (<1 MPI) percolation rates found on these three lots. Alternatively, the Applicant may submit a revised final map that identifies alternative leachfield areas with suitable site soils for on-site wastewater disposal. In this instance, the Applicant shall submit supporting soil samples and engineering analysis demonstrating that site soils can support on-site septic disposal. The Applicant shall be responsible for reimbursing County of Monterey for any costs incurred with the review of alternative leachfield areas.

Mitigation Measure WWD-1b:

Prior to the recordation of the final map, the Applicant shall submit a revised final map that either: a) merges lots 8 and 10 with adjacent lots; b) increases the horizontal separation distance between adjacent septic envelopes to a minimum of 50 feet; or (c) completion (by the Applicant) of a cumulative impact analysis addressing the potential for groundwater mounding effects between the closely spaced leachfields for proposed for Lots 4, 8, 9 and 10. The cumulative impact analysis shall be developed in consultation with EHB and shall be prepared by a qualified professional with experience in onsite wastewater analysis. The analysis shall include, but is not limited to, the following: 1) circumstances requiring cumulative impact assessment; 2) minimum qualifications of individuals performing the work; 3) data needs and assumptions; 4) analytical methods and calculations; 5) evaluation methods and criteria; 6) recommendations and/or mitigations; and, 7) provision for inclusion of specific requirements or recommendations of the California Regional Water Quality Board having jurisdiction.

The analysis should consider such factors as drainage and shallow seasonal groundwater conditions, presence of restrictive soil layers, estimated rates of lateral groundwater movement, and separation distances between adjacent leachfields. The Applicant shall submit the cumulative impact analysis to EHB for review and approval prior to the recordation of the final map.

Impact WWD-2: The Proposed Project could result in potential significant impacts to water quality as a result of construction and operation. Furthermore, the Proposed Project could result in discharge that would substantially contribute to groundwater contamination or contamination of public water supply. These impacts can be reduced to less-than-significant. (Criteria b and c).

Construction and operation of the Proposed Project could result in potentially significant impacts to water quality. Additionally, discharge as a result of the Proposed Project would contribute to substantial groundwater contamination or contamination of public water supply. High concentrations of nitrate in drinking water can be toxic to infants. This is due to certain bacteria that may be present in the digestive system of infants during the first few months of life. These bacteria cause nitrate to convert to nitrite, which in turn reacts with hemoglobin to form methemoglobin. Hemoglobin is responsible for carrying oxygen to the body; methemoglobin does not carry oxygen, and therefore can interfere with the supply of oxygen, potentially leading to suffocation. This condition is called methemoglobinemia, or commonly blue-baby.

Domestic wastewater discharged to the soil from septic systems contains high levels of nitrogen. Most of the nitrogen converts readily to the nitrate form, NO_3, during passage through the unsaturated soil zone beneath the disposal field. Nitrate is very mobile in soil and can migrate easily to the water table and then flow with the groundwater where it may enter water supplies.

According to the 1995 North Monterey County Hydrogeologic Study (Fugro West, Inc. 1995), elevated concentrations of nitrate ions from septic system discharges and agricultural return flows has affected groundwater quality in some localized areas of the region. Public water system data compiled by EHB indicates no known locations of nitrate contamination (i.e., result near or above the drinking water limit of 10 mg-N/L) within one-half mile of the Project site[3]. Water quality data for community water systems near the Project indicate nitrate concentrations in the low (< 2 mg-N/L) to moderate level (2 to 5 mg-N/L). Nevertheless, the Project site is considered by Monterey County to be within an area of documented nitrate contamination, which historically triggered additional requirements related to septic systems for existing lots and new subdivisions, including: (a) maximizing horizontal setbacks to wells; (b) prohibition of seepage pits; and (c) mandatory use of shallow leachfield systems, previously defined as less than 10 feet below natural grade. However, in accordance with the approved LAMP, new leachfield systems installed within designated Potential Aquifer Recharge Areas (Figure 2-10 of the LAMP) are now limited to a maximum depth of 5 feet. This requirement applies to the Proposed Project, as the Project site is indicated to be within a Potential Aquifer Recharge Area. The Project design has taken this into account in the evaluation, sizing, and layout of proposed septic envelopes.

The required use of shallow leachfields is intended to enhance the opportunity for removal of nitrate by denitrification and uptake by vegetation in the upper soil zones where conditions are more conducive to these processes. Shallow dispersal of effluent also increases the vertical separation to underlying groundwater, which

[3] Monterey County Water System Quality, Prepared By County of Monterey Health Department, March 2017: https://www.co.monterey.ca.us/home/showdocument?id=67378

can have a positive (although usually small) effect on nitrogen removal, e.g., via adsorption (retention on soil particles) and potentially denitrification.

Additional nitrate-related requirements for new subdivisions are limitations on lot size and residence size based on average annual rainfall and estimated nitrogen loading on a per bedroom basis as specified, respectively, in Tables 5-1 and 5-2 of the LAMP.

To further evaluate the potential nitrate impacts of the Project, Questa conducted a nitrate loading analysis of the proposed 19 residential septic system discharges. Questa completed the nitrate loading analysis using an annual chemical-water balance analysis. Questa determined the nitrate concentration in the groundwater based on the combined concentration due to wastewater loading and deep percolation of rainfall (recharge) from the Project site. Questa performed the analysis for average annual conditions and included nitrate-nitrogen contributions from existing septic systems and rainfall-recharge dilution from the entire area of the property. Please refer to **Appendix K** for detailed information on the methodology, assumptions, reference data and calculations.

Retention and percolation of stormwater is an important factor in the amount of rainfall-recharge that will occur under the developed Project conditions. Since this influences the resultant nitrate concentrations, Questa considered a range of possible stormwater retention amounts, 25%, 50%, and 75%, based on evidence of moderate to high soil-percolation capacity of the designated areas for stormwater basins. The analysis also considered a range of values for other key assumptions related to: (a) total nitrogen concentrations in septic tank effluent (60 and 65 mg-N/L); and (b) levels of denitrification in the soils (15, 20 and 25%). Effluent nitrogen concentration varies according to water use habits; 60 mg-N/L corresponds roughly to a per capita wastewater generation of about 60 gpd; 65 mg-N/L corresponds to about 55 gpd/capita. Higher rates of denitrification (e.g., 20 to 25%) would tend to correspond with shallow leachfield designs, which are a County requirement for the Project area. Results of the nitrate loading analysis for the range of possible stormwater retention volumes and other assumptions are summarized in **Table 4.14-8**.

Table 4.14-8
Resultant Groundwater-Nitrate Concentration
Beneath the Site (mg-N/L)

Percentage of Stormwater Runoff Recharge	Soil Denitrification Rate (%)	Total Nitrogen Concentration in Septic Tank Effluent 60 mg-N/L	Total Nitrogen Concentration in Septic Tank Effluent 65 mg-N/L
25%	15	11.89	12.81
25%	20	11.23	12.10
25%	25	10.58	11.40
50%	15	9.54	10.27
50%	20	9.03	9.71
50%	25	8.52	9.16
75%	15	8.03	8.63
75%	20	7.61	8.17
75%	25	7.19	7.71

Source: Questa, 2021. Nitrate Loading Analysis.
* Including one lot with supplemental treatment achieving 50% nitrogen removal

The resultant concentrations indicated in **Table 4.14-8** are the estimated long-term[4] groundwater-nitrate concentrations likely to be exhibited in the groundwater directly below the Project site and in bordering areas adjacent to the Project site in the direction of groundwater flow. In the Project area, the regional groundwater flow direction is estimated to be to the west or southwest. Locally and in the upper groundwater zones, there is likely a groundwater flow component that moves in a southerly direction, following the surface topography that runs north to south in the Project area toward Pesante Road.

The analysis shows that the Project will increase the nitrate-nitrogen concentration in the groundwater beneath the Project site to levels of 7 mg-N/L or higher, depending on the amount of stormwater percolation-recharge that can be achieved at the proposed detention basins. The analysis indicates that 25% stormwater recharge would not be sufficient to prevent resultant groundwater-nitrate levels from reaching the drinking water limit of 10 mg-N/L beneath the site.

Stormwater recharge rates of 50% or more would be the minimum necessary to provide reasonable assurance of maintaining resultant groundwater nitrogen impacts below 10 mg-N/L. Design and operating plans for the detention basins should include measures to enhance percolation and recharge to the maximum extent practicable.

Nitrogen loading impacts could also be substantially reduced by incorporating higher/supplemental levels of wastewater treatment (e.g., secondary with nitrogen removal capacity) at individual residences. However, the County of Monterey LAMP (Section 5.12) does not allow for the planned use of supplemental treatment systems for new lot creation. The one "remainder lot" within the subdivision could be developed with the use of a supplemental treatment system, which would provide a small (approximately 3 to 4 percent) reduction in the nitrogen loading impacts of the Project. If there is a reduction in the number of lots in the subdivision for other reasons (e.g., unsuitable percolation or leachfield area), the Projected nitrate loading impact would be reduced by approximately four (4) percent for each lot. For example, **Table 4.14-9** shows the reduction in nitrogen loading effects (compared to the Proposed Project) that would be achieved if the Project were to be reduced from 19 to 17 lots, and also to include the use of an advanced (supplemental) treatment unit with 50% nitrogen removal capacity on one of the parcels. A reduction in the order of 10% to 12% is indicated. Supporting calculations are provided in the appended nitrogen loading analysis.

Table 4.14-9
Comparison of Groundwater-Nitrate Concentration for Reduced Number of Lots and Supplemental Treatment on One Parcel

Percentage of Stormwater Recharge	Soil Denitrification Rate (%)	Total Nitrogen Concentration in Septic Tank Effluent 60 mg-N/L 19 Lots	Total Nitrogen Concentration in Septic Tank Effluent 60 mg-N/L 17 Lots*	Total Nitrogen Concentration in Septic Tank Effluent 65 mg-N/L 19 Lots	Total Nitrogen Concentration in Septic Tank Effluent 65 mg-N/L 17 Lots*
25%	15	11.89	10.38	12.81	11.48
25%	20	11.23	9.81	12.10	10.85
25%	25	10.58	9.25	11.40	10.22
50%	15	9.54	8.32	10.27	9.18

[4] "Long-term" in this analysis is representative of equilibrium or steady state conditions, accounting for the averaging effects of rainfall, recharge, and wastewater discharges over many decades.

Percentage of Stormwater Recharge	Soil Denitrification Rate (%)	Total Nitrogen Concentration in Septic Tank Effluent 60 mg-N/L 19 Lots	Total Nitrogen Concentration in Septic Tank Effluent 60 mg-N/L 17 Lots*	Total Nitrogen Concentration in Septic Tank Effluent 65 mg-N/L 19 Lots	Total Nitrogen Concentration in Septic Tank Effluent 65 mg-N/L 17 Lots*
50%	20	9.03	7.88	9.71	8.69
50%	25	8.52	7.44	9.16	8.20
75%	15	8.03	7.00	8.63	7.71
75%	20	7.61	6.64	8.17	7.31
75%	25	7.19	6.28	7.71	6.90

Source: Questa, 2021. Nitrate Loading Analysis.
* Including one lot with supplemental treatment achieving 50% nitrogen removal

Based on Questa's analysis, it can be concluded that the septic system discharges for the Project would have the potential to significantly increase the nitrate concentration in groundwater beneath the Project site and beneath the bordering areas to the west and south of the Project, potentially to levels approaching or exceeding the drinking water limit of 10 mg-N/L. However, the increase in nitrate concentrations can be mitigated through the incorporation of measures that provide for substantial (50% or more) retention–percolation of stormwater runoff, as identified in the Project plans. Reduction in the number of lots would also incrementally decrease the Projected impact on groundwater nitrate concentrations.

The Project would result in potentially significant impacts on groundwater quality from wastewater nitrate additions. This impact can be reduced to a level of less-than-significant through the incorporation of measures that provide for substantial (50% or more) retention–percolation of stormwater runoff. The Proposed Project includes two detention-retention facilities, the larger of which would be capable of providing more than 50% percolation of total Project site stormwater runoff as discussed in **Section 4.9, Hydrology and Water Quality** and **Section 4.15, Water Supply**. Reduction in the number of lots, by two (2) to four (4) lots for example, would have an additional mitigating effect; but without substantial stormwater retention it would not be sufficient on its own to reduce the projected impacts to a less-than-significant level.

Significant: Less than Significant.

Mitigation: None.

4.14.5 REFERENCES

Fugro West, Inc. 1996. *North Monterey County Hydrogeologic Study, Volume II, Critical Issues Report and Interim Management Plan.*

Haro, Kasunich and Associates, Inc. 2004. *Volume One, Preliminary Geologic and Geotechnical Report for La Tourette, a Residential Subdivision, Monterey County, California.*

He, Minxue, Andrew Schwarz, Elissa Lynn, Michael Anderson (California Department of Water Resources). 2018. *Projected Changes in Precipitation, Temperature, and Drought across California's Hydrologic Regions. California's Fourth Climate Change Assessment*. Publication number: CCCA4-EXT-2018-002.

Questa, 2022. *Nitrate Loading Analysis.*

_____. 2022. *Water Balance Analysis*.

United States Department of Agriculture (USDA) Soil Conservation Service (SCS). 1978. *Soil Survey of Monterey County*.

4.15 WATER SUPPLY

4.15.1 INTRODUCTION

This section addresses the potential water supply impacts associated with the Proposed Project. This section: 1) describes the environmental setting, 2) identifies the regulatory requirements applicable to the Proposed Project, and 3) evaluates the potential environmental effects associated with the Proposed Project. Where appropriate, this section includes mitigation measures to reduce the extent of project-induced impacts to a less-than-significant level. **Table 4.15-1** summarizes the Proposed Project's anticipated environmental effects, recommended mitigation measures (if applicable), and the significance of potential environmental effects following the implementation of identified mitigation measures. For more information, please refer to **Section 4.15.4, Impacts and Mitigation Measures**.

Questa Engineering Corporation ("Questa") provided technical assistance preparing this section, which is based on the following: the review of available water system information for the Woodland Heights Mutual Water Company, including a supplemental pumping test of the main well conducted in November 2019; review of regional hydrogeologic information for northern Monterey County; and a comprehensive evaluation of pre- and post-development groundwater demand and recharge.

Table 4.15-1
Summary of Water Supply Impacts and Mitigation

Impact	Summary	Significance	Mitigation Measure	Residual Impact
WS-1	The Proposed Project could potentially deplete ground supplies or interfere with groundwater recharge due to increased water demand associated with the Proposed Project. This could potentially result in a net deficit in aquifer volume or a lowering of the local groundwater table level.	Potentially Significant	WS-1 WS-2 WS-3 WS-4 WS-5	Less than significant
WS-2	The Proposed Project would require the expansion of existing water distribution facilities, the construction of which could cause significant environmental effects.	Potentially Significant	See sections: 4.3, Biological Resources 4.4, Cultural and Tribal Resources 4.6, Geology and Soils 4.8, Hazards 4.9, Hydrology and Water Quality	Less than significant
WS-3	The Proposed Project would increase the demand for water supply on the existing WHMWC. This could potentially constitute a significant impact if: a) new or expanded facilities are necessary to serve the Proposed Project or b) there would be a lack of a long-term sustainable water supply to serve the Proposed Project. While there is an adequate long-term sustainable water supply to serve the Proposed Project, additional facilities would be necessary to ensure that the WHMWC can serve the Proposed Project, as well as existing connections.	Potentially Significant	WS-6	Less than Significant

4.15.2 ENVIRONMENTAL SETTING

4.15.2.1 Regional Groundwater Resources

The North Monterey County Hydrogeologic Study (Furgo West, Inc., 1995) describes north Monterey County's groundwater conditions. Furgo West, Inc. ("Furgo West") determined the groundwater conditions based on the geologic depositional history of the study area and the available geologic and well-completion data. The following discussion summarizes the findings of the North Monterey County Hydrogeologic Study.

The Aromas Sand Formation is the primary water-bearing unit in the Prunedale area (Ibid.). The formation ranges in thickness from 100 to 800 feet and is a composite of interbedded sand, clay, and gravel deposited in varied depositional environments. Regional groundwater recharge to the Aromas Sands formation occurs principally from deep percolation of precipitation (Ibid.).

The North Monterey County Hydrogeologic Study divided the area into smaller subareas of similar hydrogeologic conditions. Furgo West used long-term availability of water, well yields, depth to bedrock, susceptibility to water quality problems, the volume of groundwater storage, and sources of seepage to delineate the subareas. The Project site is located at the western edge of the Granite Ridge subarea, immediately east of the Highlands South subarea (Ibid.). Hydrogeologic conditions in both subareas likely influence groundwater recharge at the Project site and groundwater yields for the Woodland Heights Mutual Water Company.

The Granite Ridge subarea is characterized by outcrops of granite and tertiary marine sediments. Due to the limited saturated thickness of granular materials in this area (Aromas Sands and weathered granite), well yields in these materials are typically low (less than 50 gallons per minute ("gpm")). In comparison, well yields from wells completed in granite or other consolidated rock materials are generally lower (less than 5 gpm) but highly variable. The variability of yields in the granite and consolidated rock materials can be attributed to the fact that groundwater in these formations occurs within fractures, and the occurrence, connectedness, and distribution of fractures is random. Furthermore, water availability problems in the subarea are compounded by low storage capacity, particularly during periods of deficient recharge. Elevated concentrations of nitrate ions from septic and agricultural return flows have affected groundwater quality in some localized areas of the subarea. Historically, significant numbers of wells have been abandoned in this subarea due to nitrate contamination (Ibid.). However, a review of nitrate data on file with the County of Monterey Environmental Health Bureau for public water systems in the Project area indicates low (0-1 milligrams per liter ("mg/L")) to moderate (2 – 25 mg/L) concentrations within a 2,500-foot ("ft") buffer area around the Project site.

The transition between the hydrogeologic conditions of the Granite Ridge subarea and the Highlands South subarea is gradual. Generally, the saturated sediments become thicker with increasing distance westward while the elevation of the underlying granite bedrock decreases to less than 100 ft Mean Sea Level ("MSL"). The Highlands South subarea is characterized as having up to 800 ft of saturated sediments (Aromas Sands and localized areas of alluvium) overlying the Purisima Formation. Increases in the thickness of the saturated sediments is proportional to increases in well yields. While groundwater storage is large and groundwater is generally readily available, the Highlands South subarea has experienced long-term trends of falling water levels. Much of the area displays water levels below sea level. Saltwater intrusion and groundwater inflow from Elkhorn Slough have resulted in localized areas where saltwater has degraded groundwater. Similar to the Granite Ridge subarea, some wells in the Highlands South subarea indicate localized elevated nitrate ion concentrations within the upper portion of the aquifer system. Although the occurrence of elevated nitrate ions

in this subarea is variable, nitrate levels have been reported as high as 100 mg/L or more in some locations (Ibid.).

4.15.2.2 Regional Groundwater Availability

Groundwater supplies in northern Monterey County have been in a state of chronic overdraft since the 1950s. According to Fugro West, groundwater extractions in the Highlands South subarea exceed recharge by an estimated 630 acre-feet per year ("AFY") in 1995 (Ibid.). In contrast, extractions in the Granite Ridge subarea were estimated to be approximately equal to recharge. However, due to the limited water storage capacity in the Granite Ridge subarea, this subarea is extremely sensitive to drought conditions (Ibid.). Since the Fugro West study, additional development over the last 25 years has increased: 1) water demand in both subareas, and 2) greater stress on the groundwater resources.

Water level data for several domestic wells in the transitional area between the Granite Ridge and Highlands South subareas show significant variability in groundwater-surface elevations (-40 to 270 feet) (Ibid.). Differences in groundwater levels can largely be attributed to the completion of wells in regional and perched aquifers. Despite this variability in groundwater-surface elevations, groundwater data from this area suggests that regional water levels continue to drop below sea level and water levels in the regional aquifer system are locally below sea level.

Groundwater storage volume in each subarea controls the subarea's ability to tolerate periods of drought and/or extractions in excess of the annual recharge rate. Given the falling water level conditions in the area and the variable well yields, generally, about 100 ft of saturated materials should provide for long-term water supply from wells. Areas with less than this amount of saturated aquifer thickness are expected to experience limited yields, be susceptible to drought, and possibly experience water quality problems. The average saturated thickness of the Highlands South and Granite Ridge subareas have been estimated at 474 and 35 ft, respectively (Fugro West, Inc., 1995). Thus, depending on the local saturated thickness, wells in the Granite Ridge subarea may not be capable of providing a long-term water supply to local users.

4.15.2.3 Historic & Existing Water Demand

Historically, the Project site has been used for agricultural and residential purposes. Onsite agricultural use entailed the operation of a goat diary between 1960 and 2000, and the site is currently improved with three (3) existing single-family residences (see **Table 4.15-2**). Historical water demand associated with the property entails the prior water usage associated with the goat dairy and existing residential demand.

According to the Project Applicant, historical water demand associated with onsite agricultural use was approximately 3,600 gallons per day ("gpd"). This water use occurred in connection with historical dairy operations for livestock watering, sanitation of equipment, cooling, processing, and other dairy needs (LaTourette, 2004). Historical water demand associated with agricultural operations would be equivalent to approximately 4.0 AFY.

Questa estimated pre-development residential water demand based on a conservative evaluation of typical consumption patterns in the Project vicinity. Residential water use varies according to the house and parcel size, landscaping, and other amenities. The existing residences on the Project site are modest in size and amenities; therefore, Questa assumed a typical residential water use value of 360 gpd (0.4 AFY) for existing and

historical conditions. This quantity is consistent with estimates by Fugro West (1995) for the Granite Ridge and Highlands South Subareas. Questa estimated that the existing water usage on the Project site from the three (3) residences is approximately 1,080 gpd, or 1.20 AFY. Two (2) existing wells located on proposed Lot 16 supply water to the site.

Table 4.15-2
Water Demand Summary - Existing Conditions

Land Use	Units	Daily Demand Factor	Annual Demand (Acre-Feet)
Residential	3 DU	360 gpd/dwelling unit	1.20 ac-ft
Goat Dairy	-	3,600 gpd[a]	4.03 ac-ft
		Total Existing Water Demand	***5.23 ac-ft***

Source: Questa, 2022. Water Balance Analysis.

4.15.2.4 Project Water Supply

The Woodland Heights Mutual Water Company ("WHMWC") would supply water to the Proposed Project. The WHMWC is a community system owned and maintained by its users.[1] The primary water source for the WHMWC is groundwater obtained from two (2) existing wells. The main well (Well No. 2) is adjacent to and west of North King Road, approximately 400 feet north of Pesante Road. A standby well (Well No. 1) is on the westerly side of Woodland Heights Lane, approximately 1,000 ft from North King Road. The water system currently serves 41 connections in the Woodland Heights and Moonglow Subdivisions. The system includes four (4) 15,000-gallon storage tanks for a total storage capacity of 60,000 gallons. The following is a brief discussion of the two (2) wells that serve the existing system.

Well No. 1

Well No. 1 is 440-ft deep with a 5-inch diameter casing and was installed in 1993. The well has a 200-ft annular seal and is screened from 240 to 440 ft. According to the Well Completion Report (1995), the well penetrates alternating layers of brown clay and coarse yellow sand over most of its depth. Soft granite was encountered at 465 during drilling. The well produced 20 gpm during a 24-hr test period when it was installed. This well is designated as a backup well, with an estimated production capacity of 30 gpm.

Well No. 2

Well No. 2 is the main well responsible for serving the WHMWC. This well is 500-ft deep with a 6-inch steel casing and was installed in 1996. The well has a 280-ft annular seal and is screened from 280 to 500 ft. According to the Well Completion Report (February 22, 1996), Well No. 2 penetrates various layers of sandy clay, sands, and gravels, and sandstone. During a pumping test in 1996, shortly after the well was installed, Well No. 2 produced 240 gpm with 25 ft of drawdown; this corresponds to a specific capacity of 9.6 gpm per foot of drawdown. The well is equipped with a three (3) horsepower pump, and is estimated to be capable of producing 110 gpm pumping against a total head of 500 ft.

[1] By definition, community water systems are those systems with 15 or more service connections. Officers of the water company are elected by the users and have designated organizational responsibilities. An operating budget funds operation, repairs, and maintenance of the system.

On November 7, 2019, the Salinas Pump Company conducted a supplemental pumping test of Well No. 2 at the request of County of Monterey. The purpose of this supplemental pump test was to obtain updated information on well production capacity to ascertain whether Well No. 2 had sufficient capacity to serve the Proposed Project. See **Appendix K** for the details of the pumping test. Salinas Pump Company pumped the well at a constant rate of 113 gpm for an 8-hour period, in accordance with State Waterworks Standards and County of Monterey requirements. The well exhibited a drawdown of 12.8 ft during the test, which remained static for the last 4.5 hours of the 8-hour test. The well recovered 97% of the drawdown depth within 1.2 hours' recovery time following pump shut-off. The specific capacity determined from this pumping test is 8.8 gpm/ft, which is about 8-percent lower than indicated from the initial 1996 pumping test. This capacity may be attributable to a decline in the static water level and/or plugging of well perforations or filter pack; a 10- to 20-percent decline in specific capacity in the years following initial testing of a new well is not uncommon.

Water Quality

The water quality of Well No. 1 and Well No. 2 is monitored for various constituents as required by the County of Monterey Environmental Health Bureau. Overall, the water quality from these wells is relatively hard, with trace amounts of several constituents and discernable amounts of others, moderate turbidity, and no bacteriological contamination. Well No. 1, the standby source, has been in continual compliance with Title 22 of California Code of Regulations, and no treatment has been proposed for this well. Raw water from Well No. 2 is in compliance with Title 22 for all primary drinking water standards except arsenic; additionally, iron and manganese levels exceed secondary drinking water standards. Treatment was added in 2004 for these constituents, as discussed below. Secondary contaminants are those that do not pose a health threat to consumers, but can affect the taste, odor, and/or color of the water. Water quality data for Well No. 2 for the years 2016 through 2020 are presented in **Table 4.15-3**. The data are for raw water from the well, with post-treatment values for arsenic, iron, and manganese.

In 2002, the water system was expanded to serve the Moonglow Subdivision. The County of Monterey Environmental Health Bureau required a treatment system to remove excess iron and manganese concentration in the source water. An iron and manganese treatment system for Well No. 2 was installed in 2004. The treatment system utilizes ozonation as its primary oxidant. Following ozonation, the water is routed through a particulate filter to remove the precipitate generated by oxidizing iron and manganese. The precipitated solids are then separated using a particulate filter comprised of rock and sand media. Maintenance of the filter involves periodic backwashing. The waste from the backwash cycle is stored in a holding tank for settling where the suspended solids are allowed to settle, and are periodically removed and hauled for offsite disposal. The residual water is then routed to a subsurface sump for disposal via percolation, in accordance with requirements of the Central Coast Regional Water Quality Control Board ("RWQCB").

Table 4.15-3
Water Quality Data - Woodland Heights MWC, 2016 – 2020
Main Well #2 (raw water, except as noted)

Constituent	Type	MCL [1] / ACL [2]	Range Of Values [3]	Violations [3]
Nitrate (NO_3-N) (ppm[6])	Primary Drinking Water Constituent [5]	10	< 2	No
Fluoride (ppm)	Primary Drinking Water Constituent [5]	2	0.31 – 0.32	No
Aluminum (ppm)	Primary Drinking Water Constituent [5]	1	<0.050	No
Arsenic (ppb[7])	Primary Drinking Water Constituent [5]	50	7.4 – 25.6	Yes
Arsenic, post-treatment (ppb)	Primary Drinking Water Constituent [5]	50	5.4 --13	Yes
Cadmium (ppm)	Primary Drinking Water Constituent [5]	5	< 1	No
Chromium (ppm)	Primary Drinking Water Constituent [5]	50	< 1	No
Lead (ppb)	Primary Drinking Water Constituent [5]	0.015	<0.005	No
Copper (ppm)	Primary Drinking Water Constituent [5]	1.3	<0.05	No
Mercury (ppb)	Primary Drinking Water Constituent [5]	2	< 1	No
Selenium (ppb)	Primary Drinking Water Constituent [5]	50	< 5	No
Barium (ppb)	Primary Drinking Water Constituent [5]	1,000	220 - 230	No
Sodium (ppm)	Primary Drinking Water Constituent [5]	n/a	120 - 130	No
Color (ppm)	Secondary Compounds (Aesthetics) [8]	15	< 5 - 7	No
Copper (ppb)	Secondary Compounds (Aesthetics) [8]	1,000	< 50	No
Iron (ppb)	Secondary Compounds (Aesthetics) [8]	300	146 - 610	Yes
Iron, post-treatment (ppb)	Secondary Compounds (Aesthetics) [8]	300	< 10 - 310	Yes
Manganese (ppb)	Secondary Compounds (Aesthetics) [8]	50	24 - 60	Yes
Manganese. post-treatment (ppb)	Secondary Compounds (Aesthetics) [8]	50	5 - 18	No
Silver (ppb)	Secondary Compounds (Aesthetics) [8]	100	< 10	No
Zinc (ppm)	Secondary Compounds (Aesthetics) [8]	5	<0.05	No
Chloride (ppm)	Secondary Compounds (Aesthetics) [8]	500	220 - 250	No
Specific Conductance	Secondary Compounds (Aesthetics) [8]	1,600	660 – 1,100	No
Sulfate (ppm)	Secondary Compounds (Aesthetics) [8]	500	0.9 – 1.6	No
Total Dissolved Solids (ppm)	Secondary Compounds (Aesthetics) [8]	1,000	620	No
Toluene (ppb)	Organic Chemicals	150	< 0.5	No
Alpha Activity, Gross (pCi/L)	Organic Chemicals	15	ND – 2.16	No
Fecal coliform/E.Coli (# monthly positive samples)	Microbiological Contaminants	n/a	0	No
Total Coliform (# monthly positive samples)	Microbiological Contaminants	1 per month	0 - 1	No
Turbidity (NTU)	Microbiological Contaminants	5	3.5	No

Source: Woodland Heights MWC
NOTES:
1. MCL = Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water.
2. AL = Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements.
3. Based on Consumer Confidence Report for the WHMWC for 2016 and State Water Board database for public water systems.
4. Derived from EPA National Drinking Water Standards.
5. Primary Drinking Water Standards (PDWS): MCLs for contaminants that affect human health. The US E.P.A has established monitoring, reporting, and water treatment requirements for PDWS.
6. ppm = parts per million or milligrams per liter (mg/L).
7. ppb = parts per billion or micrograms per liter (ug/L).
8. Secondary Drinking Water Standards (SDWS): MCLs for contaminants that affect odor, taste, and the appearance of drinking water. Contaminants with SDWSs do not affect human health at the MCL levels.

4.15.3 REGULATORY ENVIRONMENT

4.15.3.1 Local

Monterey County Water Resources Agency. The Monterey County Water Resources Agency ("MCWRA") has jurisdiction over water resource issues pertaining to Monterey County, including both incorporated and unincorporated areas. The MCWRA is authorized to manage the groundwater in the greater Salinas Valley Groundwater Basin and all of its respective sub-basins. In connection with such groundwater activities, the MCWRA is authorized to promote conservation, prevent waste, and prevent groundwater extractions which are considered harmful to the present and future uses of the groundwater basin.

In response to continued overdraft conditions in the Salinas Valley Groundwater Basin contributing to the intrusion of seawater into the basin along the coast, the County Board of Supervisors adopted an ordinance that requires all areas in Agency Zones 2, 2A, and 2B develop and implement an urban water conservation plan. The Project site is not located within one of these zones.

Salinas Valley Water Project. The Salinas Valley Water Project ("SVWP"), approved by voters in 2003, was developed to improve groundwater resources' long-term management and protection in the Salinas Valley Groundwater Basin. The SVWP is comprised of two primary components: (1) enlargement of the spillway at Nacimiento Dam to handle a maximum probable flood and prolong releases of water to the Salinas River so that the basin's groundwater can be recharged; and (2) installing a rubber dam on the Salinas River near Marina to temporarily store and divert water during dry periods. The SVWP allows for 12,000 to 25,000 acre-feet of water per year to be diverted from the Salinas River and pumped to the Castroville Seawater Intrusion Project ("CSIP") system to reduce groundwater pumping and recharge the area's aquifers (MCWRA, 2021). Construction of the Nacimiento Spillway Modification was completed in 2009, and Salinas River Diversion Facility began its operation in April 2010.

County of Monterey 1982 General Plan. The County of Monterey General Plan includes policies related to water supply. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing** for a detailed analysis of the Project's consistency with the County's General Plan water supply policies. Relevant policies including the following:

6.1.1 Increased uses of groundwater shall be carefully managed, especially in areas known to have groundwater overdrafting.

6.1.2 Water conservation measures for all types of land uses shall be encouraged.

26.1.4.3 A standard tentative subdivision map and/or vesting tentative and/or Preliminary Project Review Subdivision map application for either a standard or minor subdivision shall not be approved until:

- The Applicant provides evidence of an assured long-term water supply in terms of yield and quality for all lots which are to be created through subdivision. A recommendation on the water supply shall be made to the decision-making body by the County's Health Officer and the General Manager of the Water Resources Agency, or their respective designees.

- The Applicant provides proof that the water supply to serve the lots meets both the water quality and quantity standards as set forth in Title 22 of the California Code of Regulations, and Chapters 15.04 and 15.08 of the Monterey County Code subject to the review and recommendation by the County's Health Officer to the decision making body.

53.1.3 The County shall not allow water consuming development in areas which do not have proven adequate water supplies.

53.1.4 New development shall be required to connect to existing water service providers which are public utilities, where feasible.

North County Area Plan. The North County Area Plan ("NCAP"), as one of the area plans of Monterey County, further defines the Monterey County General Plan as it is more specific due to its geographic focus. Policies within the NCAP are consistent with the Monterey County General Plan but are adapted to the development opportunities, constraints, and natural resources unique to the area. The NCAP includes policies related to water supply. Please refer to **Table 4.10-4** in **Section 4.10, Land Use, Population, and Housing** for a detailed analysis of the Project's consistency with applicable NCAP policies related to water supply policies.

6.1.4 (NC) New development shall be phased until a safe, long-term yield of water supply can be demonstrated and maintained. Development levels that generate water demand exceeding safe yields of local aquifers shall only be allowed once additional water supplies are secured.

26.1.4.3 (NC) A standard tentative subdivision map and/or vesting tentative and/or preliminary project review subdivision map application for either a standard or minor subdivision shall not be approved until:

1) The Applicant provides evidence of an assured long-term water supply in terms of yield and quality for all lots which are to be created through subdivision. A recommendation on the water supply shall be made to the decision making 66 body by the County's Health Officer and the General Manager of the Water Resources Agency, or their respective designees.

2) The Applicant provides proof that the water supply to serve the lots meets both the water quality and quantity standards as set forth in Title 22 of the California Code of Regulations, and Chapters 15.04 and 15.08 of the Monterey County Code subject to the review and recommendation by the County's Health Officer to the decision making body.

4.15.4 IMPACTS AND MITIGATION MEASURES

4.15.4.1 Thresholds of Significance

A project impact may be considered significant if the Project would:

a. Substantially deplete the groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);

b. Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or

c. Have insufficient water supplies available to serve the Project from existing entitlements and resources, or require new or expanded entitlements.

4.15.4.2 Impact Analysis

Impact WS-1: The Proposed Project could potentially deplete ground supplies or interfere with groundwater recharge due to increased water demand associated with the Proposed Project. This could potentially result in a net deficit in aquifer volume or a lowering of the local groundwater table level. This represents a potentially significant impact that could be reduced to a less than significant level with the implementation of mitigation. (Criterion a).

The Proposed Project would result in a temporary increase in water use associated with construction-related activities and would also result in a permanent increase in water use in connection with future residential use of the site. As noted above, the Proposed Project site has been historically used for agricultural and residential purposes and is currently developed with three (3) existing residences. The following impact analysis includes an evaluation of the Proposed Project's potential construction-related impacts and potential operational effects associated with future residential use of the site.

Construction Impacts

Construction water demands include water required for fill placement, and water required for temporary purposes such as dust control. Construction water is a short-term impact and is often reduced by using recycled water or sub-potable sources where feasible. The greatest need would be for dust control during various stages of road grading, including initial clearing, rough grading, finish grading, paving and structures. Daily usage would depend on how the work progresses; i.e., how much of site is disturbed at any given time. On a daily basis, a rule of thumb for dust control would be roughly 300 gallons per acre for the sandy soil conditions on the site. It is anticipated that a substantial percentage and possibly all of the required water could be supplied from the onsite wells, in combination with temporary water storage tanks. To minimize short-term impacts associated construction water use the Proposed Project could consider a number of practices, including making optimum use of onsite well water, installing temporary water storage tanks, and timing/phasing of work to minimize daily demand. Construction water use would be temporary in nature and is not anticipated to be significant. This represents a less than significant impact.

Operational Impacts

The Proposed Project would result in the construction of 19 residences. As noted above, there are three (3) existing residences onsite. For the purposes of estimating anticipated future water demand, the Proposed Project would result in a potentially significant impact if anticipated future water demand would exceed estimated groundwater recharge such that there would be a net decrease in aquifer storage. The following impact analysis: 1) identifies anticipated future operational water demand, 2) summarizes the water balance analysis performed by Questa; and 3) evaluates the Proposed Project's potential environmental effects. A copy of the water balance analysis is also included in **Appendix K.**

Future Water Demand. Development of the Proposed Project would consist of 19 single-family dwelling units. Questa estimated anticipated water demand for new homes based on a conservative (safe) assumption that the homes would be larger and contain more modern amenities and landscaping as compared with the existing residences. Questa utilized a demand of 500 gpd per dwelling unit to estimate future water use for the Proposed Project; this is consistent with the projections made for the neighboring Moonglow Subdivision (Moonglow Well Treatment Plant, 2002). Questa estimated that the anticipated daily water demand for the 19 proposed residential units would be approximately 9,500 gpd or 10.6 AFY. **Table 4.15-4** identifies water demand estimates for pre- and post-development conditions. As indicated in **Table 4.15-4**, the Proposed Project would increase water demand on the site by approximately 5.41 AFY (10.64 AFY vs. 5.23 AFY) as compared to historical demand.

Table 4.15-4
Water Demand Summary – Existing Conditions and Future Demand

Land Use	Units	Daily Demand Factor	Annual Demand (Acre-Feet)
Residential – Existing	3 DU	360 gpd/dwelling unit	1.20 ac-ft
Goat Dairy - Existing	-	3,600 gpd[a]	4.03 ac-ft
		Total Existing Water Demand	***5.23 ac-ft***
Residential - Future	19 DU	500 gpd/dwelling unit	10.64 ac-ft
		Total Future Water Demand	**10.64 ac-ft**
		Net Increase in Water Demand	**5.41 ac-ft**

Source: Questa, 2022. Water Balance Analysis.

Water Balance. The Proposed Project would alter the groundwater hydrology of the project site and vicinity through (a) conversion of the landscape from very low-density rural residential/agriculture to a residential subdivision consisting of 19 homes; (b) extraction of groundwater for domestic water supply; (c) onsite percolation of wastewater via leach fields; and (d) infiltration drainage/recharge of rainfall-runoff in onsite detention-sedimentation ponds. Questa evaluated the potential estimated changes in the hydrology through the completion of a water balance analysis (presented below). The water balance compares existing conditions and future, post-development conditions to ascertain the significance of future water demand associated with the Proposed Project.

A water balance analysis is an accounting model that tracks water flows into and out of the particular hydrologic system. For the Proposed Project, this analysis focuses on changes in the groundwater system in the immediate project vicinity. Questa evaluated the change by comparing the estimated amount of recharge, before and after, along with the amount of groundwater that would be extracted for project uses, as discussed above.

Questa completed an analysis of groundwater recharge for pre-and post-development conditions to estimate the potential effects of proposed changes in land use conditions. Key sources of groundwater recharge at the project site include direct infiltration of rainfall, percolation of sewage effluent through leach fields, and induced infiltration of rainfall-runoff at the proposed detention-retention ponds. Seepage losses from landscape irrigation represent another possible source of recharge, usually amounting to about 10 to 20 percent of the irrigation water demand. However, Questa did not consider seepage losses from landscape irrigation as part of this analysis on the assumption that the Proposed Project would use drought tolerant landscaping and well-controlled irrigation systems to reduce these losses to negligible levels.

Estimates of groundwater recharge for existing and future development conditions are summarized in **Table 4.15-5**. **Appendix K** provides a description, supporting data, and calculations. Key factors are summarized below.

- **Open Space Rainfall-Recharge**. Using monthly time steps and average climatic conditions, the analysis estimates the amount of rainfall that runs off during storm events, the amount that is taken up by vegetation or evaporation from the soil surface, and the remainder that is left to percolate into the soil and eventually the groundwater. Questa's analysis indicates a net recharge of approximately 3.31 inches per acre per year for natural open space and landscaped area at the project site. This is based on an average annual rainfall total of 16.72 inches per year, 10 percent runoff factor (winter season only), and reference evapotranspiration data for the local climatic regime published by the California Irrigation Management Information System ("CIMIS"). Month-to-month moisture retention in the soil is also accounted for in the water balance.
- **Wastewater Percolation**. Wastewater percolation from onsite septic systems is estimated to be approximately 200 gpd (0.224 AFY) per residence. This represents the long-term average wastewater flow. This differs from the design wastewater flow for individual septic systems, which would typically be about double this amount to provide capacity for peak daily wastewater flow conditions.
- **Stormwater Retention/Percolation**. The Proposed Project would create impervious surfaces for buildings, patios, driveways, and roads, which are estimated to comprise about 25 percent (11.8 acres) of the site under developed conditions; the remaining 36 acres of the site would be landscaped or remain naturally vegetated open space. The installation of impervious surfaces would decrease the land area available for rainfall percolation and evapotranspiration losses. The runoff from impervious surfaces and adjacent lands would be channeled through two (2) detention-retention basins on the southern (downstream) side of the site. These basins have the potential to capture and induce percolation of significant amounts of runoff. Based on favorable soil and percolation characteristics at the locations of these basins, Questa estimates that 50 percent or more of the annual runoff volume can be captured and retained for infiltration and percolation. For impervious surface areas this results in a potential infiltration volume of 8.36 inches per acre per year, assuming 100 percent of rainfall is collected from these areas. For open space and landscaped areas, capture of 50 percent of the annual runoff (estimated to be 10 percent of 16.72 inches annual rainfall) gives a projected recharge potential of 0.836 inches per acre per year for these areas. Questa confirmed the feasibility of achieving this amount of annual stormwater retention-percolation by completing preliminary calculations of runoff-recharge for the larger of the two detention-retention basin sites (#2 which is located on proposed Lot #19) using actual daily rainfall data for the 2018-19 water year. The analysis demonstrated that, due to the size of the contributing drainage area, large available space for the basin, and rapid percolation rates, basin #2 alone can be designed to provide retention-percolation capacity equal to more than 50% of the total annual stormwater runoff for the entire site. Please see **Section 4.9, Hydrology and Water Quality,** for further discussion.

As shown in **Table 4.15-5**, under existing conditions, groundwater recharge at the project site is estimated to be 13.85 ac-ft per year, including rainfall recharge and wastewater percolation. In comparison, for the Proposed Project, the annual groundwater recharge volume from open space rainfall-recharge and wastewater percolation is estimated to increase to 14.19 AFY; but the total recharge potentially could increase to as much 24.92 AFY if the stormwater detention-retention facilities are designed and maintained to capture and percolate 50 percent of the annual runoff volume.

Table 4.15-5
Groundwater Recharge Summary (Acre-Feet Per Year)

Recharge Source	Land Cover	Area/ Unit	Annual Recharge Rate	Annual Recharge (Acre-Feet)
Existing Conditions – Rainfall Infiltration	Open Space	47.8 ac	3.31 inches/acre/ year	13.18 ac-ft
Existing Conditions – Wastewater Generation (Wastewater Percolated Back Into Groundwater via Leach Fields)	Residential	3 DU	0.224 ac-ft/dwelling unit	0.67 ac-ft
			Total Existing Recharge	***13.85 ac-ft***
Future Conditions – Rainfall Infiltration	Open Space/Landscaping	36	3.31 inches/year	9.93 ac-ft
Future Conditions - Wastewater Generation (Wastewater Percolated Back Into Groundwater via Leach Fields)	Residential	19 DU	0.224 ac-ft/dwelling unit	4.26 ac-ft
Future Conditions - Site Runoff Potentially Available for Induced Infiltration/Percolation	Impervious Surfaces	11.8	8.36 inches/acre/year	8.22ac-ft
Future Conditions - Site Runoff Potentially Available for Induced Infiltration/Percolation	Open Space/Landscaping	36	0.836 inches/acre/year	2.51ac-ft
			Total Induced Recharge Potential	*10.73* ac-ft
			Total Potential Future Recharge	***24.92 ac-ft***

Source: Questa, 2022. Water Balance Analysis.

Table 4.15-6 presents an overall annual water balance summary for pre-and post-development conditions by combining the groundwater recharge estimates with the water demand estimates. The analysis shows that with stormwater detention-retention facilities, the Project could result in a net increase in net groundwater recharge of approximately 5.66 AFY (14.28-8.62). However, without the stormwater retention contribution, the Proposed Project would result in a net loss of approximately 5.07 acre-feet of groundwater recharge per year (3.55-8.62) as compared with existing conditions. This would constitute a potentially significant impact warranting mitigation.

Table 4.15-6
Water Balance Summary

Groundwater Recharge/Withdrawal	EXISTING (acre-feet/year)	FUTURE (acre-feet/year)
Groundwater Recharge - Rainfall Infiltration	13.18	9.93
Groundwater Recharge - Percolation of Wastewater	0.67	4.26
Groundwater Recharge - Stormwater Retention/Percolation	0	10.73
Groundwater Recharge - Subtotal	***13.85***	***24.92***
Groundwater Withdrawal - Residential Use	-1.20	-10.64
Groundwater Withdrawal - Goat Dairy Operations	-4.03	0
Groundwater Withdrawal - Subtotal	***- 5.23***	***- 10.64***
Total Net Contribution to Groundwater	***+8.62***	***+14.28***
Total Net Contribution to Groundwater without Stormwater Retention	***+ 8.62***	***+ 3.55***

Source: Questa, 2022. Water Balance Analysis.

The Proposed Project's ability to balance post-development groundwater demand and post-development groundwater recharge depends on the ability of the stormwater detention-retention ponds and other drainage infiltration measures to percolate surface runoff into the local aquifer. Proper design of the stormwater detention-retention ponds is necessary to ensure the Proposed Project would not adversely affect local groundwater resources.

Without a managed stormwater detention-retention system, the Proposed Project would reduce the net groundwater recharge in the Project area by 5.07 AFY, or approximately a 0.8 percent increase in the existing net deficit of 630 AFY estimated for the Highland South Subarea. For the purposes of this analysis, a project impact may be significant if the Project would "substantially deplete the groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)."

The North Monterey County hydrogeologic area is considered in overdraft, and, therefore, reductions in groundwater recharge would further result in a decline in the groundwater balance. In the short term, the Proposed Project would aggravate groundwater declines in the North Monterey County due to increased pumping and reduction in groundwater recharge. The *1995 North Monterey County Hydrogeologic Study* estimated the sustainable yield of the Highland South subarea to be roughly 4,390 AFY, with an existing net deficit of 630 AFY. The Project would further increase this deficit by about 0.8 percent (5.07 AFY). Although the magnitude of the change is small, the reduction in net recharge would exacerbate conditions in a groundwater area that is currently out of balance. This represents a potentially significant impact that could be reduced to a less-than-significant level through the incorporation of the mitigation measures identified below.

While the Proposed Project would increase demand for groundwater resources and thereby exacerbate existing groundwater conditions, the Proposed Project is located within Zone 2C of the SVWP. As discussed above, the SVWP provides for the long-term management and protection of groundwater resources in the region to attain a balanced groundwater basin. The SVWP, which became operational in 2010, is funded through a special assessment zone, referred to as Zone 2C. Properties within Zone 2C may rely on the benefits of the SVWP for the purposes of establishing a long-term sustainable groundwater supply. Because the Proposed Project is within Zone 2C there is a sustainable long-term groundwater supply to serve the Proposed Project even though the Project would increase demand for groundwater resources. While there is a confirmed and reliable long-term sustainable source of water to serve the Proposed Project because the property is within Zone 2C of the SVWP, County of Monterey has identified additional mitigation measures to ensure that potential impacts to groundwater resources are minimized to the maximum extent feasible. The following mitigation measures identified below would ensure that the Proposed Project implements water conservation measures, prohibits the use of water intensive features, includes measures to ensure the use of water efficient landscaping, prohibits the development of accessory dwelling units, and includes design features to maximize groundwater recharge.

Conclusion

The Proposed Project would temporarily increase on-site water usage associated with construction, and permanently increase on-site water use in connection with the development of 19 new single-family residences. Water demand for the construction would be minimal and temporary, utilizing recycled or sub-potable water sources where feasible. Operational water use, however, would permanently increase water beyond existing levels. While this increased demand would potentially deplete groundwater resources and/or interfere with

groundwater rechange such that there could be a net deficit in aquifer volume or a lowering of the local groundwater table level, the implementation of mitigation measures identified below would reduce impacts to a less-than-significant level. Moreover, the Proposed Project is also within Zone 2C. Because the Proposed Project is in Zone 2C and the property owner contributes to the SVWP, the Proposed Project is considered to have a long-term sustainable groundwater supply (see discussion below for more information).

Significance: Less than Significant with Mitigation.

Mitigation:

Mitigation Measure WS-1:

Prior to recordation of the final map, the Applicant shall submit a Water Use Plan demonstrating that proposed water demand for the subdivision shall not exceed 10.64 acre-feet per year. The Water Use Plan shall assign proposed water demand for each lot; future residential use of each lot shall not exceed the assigned water demand for that lot. The Water Use Plan shall also identify annual reporting requirements and enforcement measures (e.g., warnings, penalties, etc.) to ensure that actual water use does not exceed the amount assigned for each lot. The Applicant shall record a deed restriction on each lot notifying future owners that water use on the property shall be fixed to the amount established in the approved Water Use Plan. The Water Use Plan shall be submitted to HCD – Planning, Water Resources Agency, and EHB for review and approval prior to recordation of the final map. In addition, the proposed deed restriction shall also be submitted to the County for review and approval prior to final map recordation.

Prior to recordation of the final map, the Applicant shall include **Mitigation Measure WS-1** as notes on the final map.

Concurrent with the sale of any lot, the Applicant shall fix the maximum permitted water use on that individual lot within the total water use allowed under the approved Water Use Plan, and the Applicant shall record a notice on title fixing the maximum permitted water use for that lot. The notice shall be signed by both the buyer and the seller. The Applicant shall provide a copy of the recorded notice to the County, and no building permits shall be issued on the lot until the County has received a copy of the recorded notice. Prior to the issuance of any future grading and/or building permits for development of each individual lot, the Applicant shall submit a water demand report to the HCD – Planning demonstrating that future residential use, including both interior and exterior water use, of the site would not exceed the amount established for that particular lot in the approved Water Use Plan.

Mitigation Measure WS-2:

Prior to the recordation of the final map, the Applicant shall record a deed restriction that requires the use of water conservation measures as part of all new plumbing fixtures and exterior landscaping. Specifically, the deed restriction shall require the use of low-flow plumbing fixtures in all new residences and the use of native, drought-tolerant landscaping and drip irrigation for all exterior landscaping. The deed restriction shall also prohibit water-intensive uses, including but not limited to vineyards, ornamental fountains that do not recirculate water, and washing of hard surfaces such as

streets, gutters, sidewalks, and driveways in any portion of the proposed lots. The Applicant shall submit the deed restriction to the Monterey County HCD – Planning and the Water Resources Agency for review and approval prior to the recordation of the final map.

Prior to recordation of the final map, the Applicant shall include **Mitigation Measure WS-2** as notes on the final map.

Mitigation Measure WS-3:

Prior to the issuance of any building permit for each residence, the Applicant shall submit a landscape design package that includes the use of drought-tolerant landscaping, as well as the use of drip irrigation. The landscape design package shall include a water-efficient landscape sheet, soil management report, landscape design plan, irrigation design plan, and grading design plan. The package shall demonstrate compliance with the substantive requirements of the Department of Water Resources' Model Water Efficient Landscape Ordinance, Title 23, California Code of Regulations, Sections 490-495, or any subsequent water conservation ordinance adopted by the County for the same purpose that is in effect at the time of building permit issuance. The final map and each site plan shall indicate that submittal and approval of the landscape documentation package for each lot is necessary for development of the lot prior to issuance of any building permit. The County of Monterey HCD – Planning shall review and approve the landscape design package prior to the issuance of each building permit.

Mitigation Measure WS-4:

Prior to the recordation of the final map, the Applicant shall submit detailed design-level plans and supporting technical documentation for the proposed retention-detention facilities demonstrating that the on-site facilities can achieve a minimum 50% recharge rate. A registered civil engineer shall prepare the design-level plans and the design-level plans shall be accompanied by a hydrologic report certifying that the proposed detention-retention facilities are designed to achieve a minimum 50% recharge. The detention-retention facilities shall be sized to maximize the retention and recharge of rainfall on-site. The Applicant shall submit the design-level plans and supporting technical documentation for the retention-detention facilities to HCD – Environmental Services for review and approval.

Prior to approval of subdivision improvement plans, the Applicant shall include the approved design-level plans and supporting technical documentation for the retention-detention facilities within the subdivision improvement plans.

Mitigation Measure WS-5:

Prior to the recordation of the final map, the Applicant shall prepare an Operations and Maintenance Plan for ongoing inspection, monitoring, and maintenance of on-site drainage facilities, including all measures used for infiltration and water quality control. The maintenance plan shall include, but not limited to, the following:

- Maintenance schedule, including frequency, and responsible party (or parties);
- Proof of funding sources for ongoing maintenance;

- Reporting schedule (at least annually);
- Inspection of facilities following any major storm event and removal of accumulated sediments;
- Weekly inspection of the facilities while the Project is under construction and during the rainy season (October through April).

The Maintenance Plan shall be submitted for review and approval by the HCD-Environmental Services and Monterey County Water Resources Agency.

Impact WS-2: The Proposed Project would require the expansion of existing water distribution system facilities, the construction of which could cause significant environmental effects. This represents a potentially significant impact that could be reduced to a less-than significant level with the implementation of mitigation. (Criterion b).

WHMWC would supply water for the Proposed Project. As discussed above, WHMWC previously acknowledged the availability of water and their intention to serve the Proposed Project; however, the expansion of existing water distribution system facilities would be necessary to serve the Proposed Project. This would entail the construction of new storage facilities, a new standby well, water distribution pipelines, and related infrastructure.

The expansion/construction of new water supply facilities could cause potentially significant environmental effects similar to those identified in other sections of this EIR. For instance, construction-related impacts could include erosion, the creation of sources of polluted runoff, and require vegetation removal. These effects would be reduced to less-than-significant through the implementation of the mitigation measures identified in **Section 4.3 Biological Resources, Section 4.4 Cultural and Tribal Resources, Section 4.6 Geology and Soils, Section 4.8 Hazards, Section 4.9 Hydrology and Water Quality.** For more information, please refer to those sections. Additionally, implementation of standard construction Best Management Practices ("BMPs") would further reduce potential temporary construction-related effects associated with the construction of water distribution system improvements. Applicable BMPs may include:

- Properly stockpiling and disposing of demolition debris, concrete, and soil.
- Protecting existing storm drain inlets and stabilizing disturbed areas.
- Hydroseeding/re-vegetating disturbed areas.
- Minimizing areas of impervious surfaces.
- Implementing runoff controls (e.g., percolation basins and drainage facilities).
- Properly managing construction materials.
- Managing waste, aggressively controlling litter, and implementing sediment controls.
- Limiting grading to the minimum area necessary for construction and operation of the Project.

While the Proposed Project would require the expansion of water distribution system improvements to serve the Proposed Project, the construction of these facilities would not result in any additional environmental effects beyond those identified in this EIR. In other words, construction of water distribution system improvements would result in substantially similar impacts as those disclosed in this EIR. These effects would be reduced to a less-than-significant level through the incorporation of existing mitigation identified in this

EIR. This represents a potentially significant impact that would be reduced to less-than significant with mitigation.

Significance: Less-than Significant with Mitigation.

Mitigation:

Please see **Section 4.3, Biological Resources, Section 4.4, Cultural and Tribal Resources, Section 4.6, Geology and Soils, Section 4.8, Hazards**, and **Section 4.9, Hydrology and Water Quality.**

Impact WS-3: The Proposed Project would increase the demand for water supply on the existing WHMWC. This could potentially constitute a significant impact if: a) new or expanded facilities are necessary to serve the Proposed Project or b) there would be a lack of a long-term sustainable water supply to serve the Proposed Project. While there is an adequate long-term sustainable water supply to serve the Proposed Project, additional facilities would be necessary to ensure that the WHMWC can serve the Proposed Project, as well as existing connections. This represents a potentially significant impact that could be reduced to a less-than-significant level. (Criterion c).

As noted above, WHMWC would serve the Proposed Project. The existing WHMWC consists of two (2) wells, four (4) 15,000-gallon storage tanks, and currently serves 41 connections. The Proposed Project would increase the total number of connections for the WHMWC to 60 connections. As discussed above, the Proposed Project would increase water demand associated with the introduction of new residential uses. This would constitute a potentially significant impact necessitating new or expanded entitlements to serve the Proposed Project if: 1) the existing source supply (i.e., wells) does not have adequate capacity to serve the Proposed Project, or 2) the Proposed Project's incremental increase in water demand would result in a lack of a long-term reliable water supply to serve the Proposed Project.

Sufficiency of Proposed Water Supply

As noted above, the Proposed Project would increase water demand associated with new residential uses. The water demand analysis (above) anticipated that average daily water use for new residences would be approximately 500 gpd per residence (see **Table 4.15-3**). This represents a 50 percent increase in water demand on the WHMWC (41 existing connections). According to the 2002 Moonglow Well Treatment Plant – Engineer's Report for the WHMWC, the required source capacity to meet the maximum day demand for the existing 41 connections is about 50 gpm, per Chart 1 of Title 22, California Waterworks Standards in effect at the time (2002). Per Chart 1, the addition of 19 new connections would increase the source capacity requirement to approximately 70 gpm, for 60 total connections. Title 22 standards have been revised since 2002, and presently require water source capacity to be evaluated in terms of the determined "Maximum Day Demand" and "Peak Hour Demand", which are defined and estimated for the Proposed Project and WHMWC as follows:

- **Maximum Day Demand ("MDD")**. Maximum day demand is the amount of water utilized by consumers during the highest day of use (midnight to midnight), excluding fire flow. Methods for estimating MDD vary according to the availability of historical data and other project-specific factors. Using known or projected average annual household water usage, per Title 22 the estimated MDD can

be calculated as the average daily demand (500 gpd per residence) multiplied by 2.25. This gives an MDD of 1,125 gpd per connection, and total system MDD of 67,500 gpd, or four (4) gpm, for 60 connections. This is less than the 70 gpm calculated under the water sizing criteria (Chart 1) formerly contained in Title 22.

- **Peak Hour Demand ("PHD")**. Peak hour demand is the amount of water utilized by consumers during the highest hour of use during the maximum day, excluding fire flow. It can be estimated as equal to 1.5 times the average hourly water demand determined from the MDD. For the above estimated MDD of 1,125 gpd/connection, the average hourly demand spread over 16 hours of the day would be about 70 gallons per hour/connection, with a PHD of 105 gallons/connection. The total system PHD for 60 connections would be about 6,300 gallons (per hour).

Based on an average daily water usage of 500 gpd/connection (annual basis), the projected average water demand for the WHMWC system for 60 connections would be 30,000 gpd, or approximately 21 gpm.

Source Capacity and Drawdown. Based on the pumping test results performed after the well was installed in 1996, the specific capacity of Well No. 2 was determined to be 9.6 gpm per foot of drawdown (240 gpm/25 feet of drawdown). The more recent (2019) pump test for Well No. 2 indicates an approximate 8 percent decline in the specific capacity to 8.8 gpm/ft. Using this value, Questa calculated the estimated drawdown in Well No. 2 as follows for the MDD, PHD and average annual water usage for the WHMWC system with the addition of the Proposed Project (60 total connections):

- **Maximum Day Demand**: (47 gpm)/(8.8 gpm/ft) = 5.3 feet of drawdown
- **Peak Hour Demand**: (105 gpm)/(8.8 gpm/ft) = 11.9 feet of drawdown
- **Average Annual Demand**: (21 gpm)/(8.8 gpm/ft) = 2.4 feet of drawdown

The pump in Well No. 2 is currently set at a depth of 300 ft, with the static water level at a depth of about 220 ft. This gives a saturated thickness of approximately 80 feet to absorb the drawdown effects of pumping. Normal practice limits the available well drawdown to no more than two-thirds of the total saturated thickness, which would be approximately 54 ft. The projected maximum day and peak hour drawdown projections of 5.3 to 11.9 ft equate to about 10 to 22 percent of the available drawdown. On an annual basis, the projected drawdown of 2.4 ft is less than 5 percent of the available drawdown. Based on this analysis, Questa concluded that the projected groundwater drawdown at the well during pumping would amount to only a small fraction of the available well capacity (i.e., 54 feet of potential drawdown) and that the aquifer and well production capacity are adequate to meet the added water supply requirements for the Proposed Project.

Alternate, Back-up Supply. Well No. 1 serves as a designated backup water source for the WHWMC system, and this well has a lower rated capacity of approximately 30 gpm. At this pumping rate, Well No. 1 would be able to supply the average daily water demands for 60 connections (21.5 gpm), but would require drawing water from storage to meet the projected MDD (48.4 gpm) and PHD (108 gpm), per calculations above. As a result, County of Monterey Environmental Health Bureau determined that an additional backup well is necessary to ensure that there is adequate capacity to serve the Proposed Project if Well No. 2 fails or becomes temporarily inoperable. Because the existing standby well does not have adequate capacity to serve the increased water

demand associated with the Proposed Project, mitigation is necessary to reduce this impact to a less-than-significant level.[2]

In summary, sufficient source capacity and water supply facilities are available to accommodate the increased demand associated with the Proposed Project. However, the County of Monterey has identified that an additional backup well is necessary to ensure there is adequate capacity to serve the Proposed Project in the event of well failure or if Well No. 2 becomes temporarily inoperable. Having this backup well production capacity is a requirement of the California Waterworks Standards, Title 22, Chapter 16, Article 2. §64554 for community water systems such as WHWMC. **Mitigation Measure WS-6** identified below would ensure that there is adequate backup capacity to serve the Proposed Project. The implementation of this mitigation measure would reduce this impact to a less-than-significant level.

Long-term Sustainable Supply

Safe yield is defined as the amount of water that can be extracted continuously from the basin or hydrologic subarea without degrading water quality or damaging the economic extraction of water, or producing unmitigable environmental impacts (Monterey County Code Section 19.02.143). Title 19 of the Monterey County Code requires verification of sustainable water supplies at safe yields for new subdivisions.

Seawater intrusion and over-pumping of groundwater have been a long-standing problem in the Salinas Valley dating back to the 1950s. Over many years, the Monterey County Water Resources Agency ("MCWRA") has developed and implemented facilities and programs to address these issues. The first stage was the construction of Nacimiento and San Antonio Dams for flood control and downstream aquifer recharge. This was followed by implementation of the Monterey County Water Recycling project consisting of the Salinas Valley Reclamation Project (recycled water) and the Castroville Seawater Intrusion Project ("CSIP"), a distribution and supplemental well system serving 12,000 acres of prime farmland in the Castroville area. Under the Salinas Valley Water Project ("SVWP") modifications were made in 2009 to the Nacimiento Dam spillway to improve flood flow capacity and the ability to make additional water releases of up to 30,000 AFY through (1) conservation releases for infiltration along the length of the Salinas Riverbed; and (2) diversion, distribution, and delivery of water to agricultural users for irrigation. In 2010 the Salinas River Diversion Facility ("SRDF") was constructed to provide treated (filtered, chlorinated) river water to growers in the CSIP area to reduce the need to pump groundwater except in periods of extremely high demand. It consists of installing a rubber dam on the Salinas River near Marina to temporarily store and divert water (released from upstream dams) during dry periods. The full impoundment created by the removable dam holds approximately 120 acre-feet of water and extends approximately three (3) miles upriver. During operational periods, the supplemental irrigation water provided to growers has helped to reduce peak groundwater pumping activity by up to 80 percent during periods of peak demand in the CSIP area (North Monterey County). The Proposed Project lies within Zone 2C of the Highlands South subarea, which has been identified as a zone of benefit for the SVWP.

[2] A 0.09-acre "Well Lot," adjacent to Lot #9 in the adjacent Moonglow Estates Subdivision (APN 125-092-009) serves as a designated location for a future third well site for the WHMWC. The "Well Lot" is adjacent to North King Road, approximately 700 ft north of the intersection with Pesante Road, and about 200 feet north of the existing main water supply Well No. 2. Due to this site's proximity to Well No. 2 similar hydrogeology and potential for developing a high production backup or replacement well can be expected to exist at this designated alternate/supplemental well site.

Conclusion

As discussed above, there is sufficient existing production capacity to serve the Proposed Project's increased water demand from the main water supply well, Well No. 2. However, the existing backup well, Well No. 1., does not have sufficient capacity to meet the increased demand associated with the Proposed Project. This represents a potentially significant impact if Well No. 2 fails or becomes temporarily inoperable. The County of Monterey identified that mitigation is necessary to ensure that there is backup well with adequate production capacity to ensure that WHMWC can serve the Proposed Project and existing connections. The implementation of **Mitigation Measure WS-6** would ensure that impacts would be less-than-significant. While mitigation is necessary to ensure that there is adequate backup well capacity, the above analysis indicates that there is an adequate long-term sustainable water supply to serve the Proposed Project and that additional entitlements would not be necessary to ensure that there is adequate water supply, including fire flow, to serve the Proposed Project.

Significance: Less-than Significant with Mitigation.

Mitigation:

Mitigation Measure WS-6:

Prior to the recordation of the final map, the Project Applicant shall install (or bond) the standby well. The well shall have sufficient capacity to serve the Proposed Project and existing connections currently served by the Woodland Heights Mutual Water Company. The well shall be installed to the satisfaction of the County of Monterey Environmental Health Bureau.

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Chapter 5 CEQA CONSIDERATIONS

CEQA Guidelines Sec. 15126 requires that all aspects of a project, including planning, acquisition, development, and operation, must be considered when evaluating the Project's potential effects on the environment. As part of this analysis, an EIR must evaluate the:

a. Significant environmental effects of the proposed project;

b. Significant environmental effects which cannot be avoided if the project is implemented;

c. Significant irreversible environmental changes which would be involved in the project should it be implemented;

d. Growth-inducing impacts of the project;

e. Mitigation measures proposed to minimize the significant effects; and

f. Alternatives to the project.

Consistent with the requirements of CEQA Guidelines Sec. 15126, this chapter evaluates the Proposed Project's potential growth-inducing effects (CEQA Guidelines Sec. 15126(d)), significant and unavoidable effects (CEQA Guidelines Sec. 15126.2(a) and 15126.2(b)), and significant irreversible environmental changes (15126.2(c)). An evaluation of project alternatives (CEQA Guidelines Sec. 15126.6) is included in **Chapter 6, Alternatives.** This chapter also includes an evaluation of potential cumulative effects (CEQA Guidelines Sec. 15130) and effects found not to be significant (CEQA Guidelines Sec. 15128).

5.1 GROWTH INDUCEMENT

5.1.1 INTRODUCTION

CEQA requires an EIR to discuss the ways in which a project could foster economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment (CEQA Guidelines Sec. 15126.2(e)). Projects that could potentially induce growth include projects that would remove obstacles to population growth, such as the lack of available infrastructure or water supply. Recognizing the inherent difficulties involved in forecasting the extent and type of development that a particular project might foster, CEQA calls for a general assessment of possible growth-inducing impacts rather than a detailed analysis of a project's specific impacts on growth.

The CEQA Guidelines state that "it must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment" (ibid). Typically, a project's growth inducing effects would be considered significant if the project:

- Provides infrastructure or capacity to accommodate growth beyond the levels currently permitted in applicable local and regional plans and policies.
- Encourages growth or a concentration of population in excess of what is planned for in the applicable general plan or other land use plan, or in projections made by regional planning agencies, in this instance the Association of Monterey Bay Area Governments ("AMBAG").

- Adversely affects the ability of agencies to provide needed public services or infrastructure.
- In some other way significantly affects the environment, such as through a substantial increase in traffic congestion or deterioration of air quality.

As described below, the environmental effects of potential induced growth are considered secondary or indirect effects. Typically, potential growth-inducing projects can result in a variety of secondary effects, such as increased demand for public services and utilities, increased traffic and noise, localized air quality impacts, conversion of agricultural land to urban uses, or similar effects. The Proposed Project's potential growth inducing effects are described below.

5.1.2 POTENTIAL GROWTH RELATED TO THE PROJECT

The Project would facilitate growth in the Prunedale area. The unincorporated portion of Monterey County has an existing population (2020) of 100,213. Prunedale area's existing population (2019) is 20,327. As identified in **Section 4.10, Land Use, Population, and Housing,** the Proposed Project would increase on-site population by approximately 51 new persons. This additional population represents about 0.002 percent of Prunedale's existing (2019) population.

The addition of 51 new persons to the Prunedale area would not be considered significant in terms of regional population growth and would minimally increase demands on existing public services. The Proposed Project does not entail the development of additional infrastructure beyond that necessary to serve the Proposed Project. The Project includes private infrastructure, including roads and secondary fire access, expansion of an existing water system, and individual septic systems, to accommodate future residential buildout. The private infrastructure would be sized and located to solely serve the Proposed Project. The minor population growth associated with the Proposed Project is not anticipated to generate a substantial increase in economic activity in the Prunedale area such that secondary impacts would occur. Moreover, the Proposed Project would not generate indirect growth in connection with construction related activities. The Proposed Project would generate short-term employment opportunities during the construction phase, which would be expected to draw workers primarily from the available regional work force. Therefore, the Proposed Project would not directly or indirectly induce additional population growth beyond current levels.

The Proposed Project would contribute to growth, however, as discussed above, the addition of 51 new persons would be a minimal increase to the existing population. Moreover, the Proposed Project does not entail the construction of additional infrastructure that could accommodate additional growth and development.

5.2 CUMULATIVE IMPACTS

The purpose of the cumulative analysis is to identify and summarize the environmental effects of the Proposed Project in conjunction with the effects of existing, approved, and anticipated developments in the Project area. CEQA Guidelines Sec. 15130 requires that an EIR evaluate the cumulative effects of a proposed project when the project's incremental effect is "cumulatively considerable." A "cumulatively considerable" effect means that the incremental effects of an individual project are significant when viewed in connection with the effects of past, present, and reasonably foreseeable future projects (CEQA Guidelines Sec. 15065(a)(3)). A cumulative effect is defined as an impact which is created as a result of the contribution of the project evaluated in the EIR together with other projects causing related impacts (CEQA Guidelines Sec. 15355). When the combined

cumulative effect associated with the project's incremental effects and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative effect is not significant (CEQA Guidelines Sec. 15130(a)(2)).

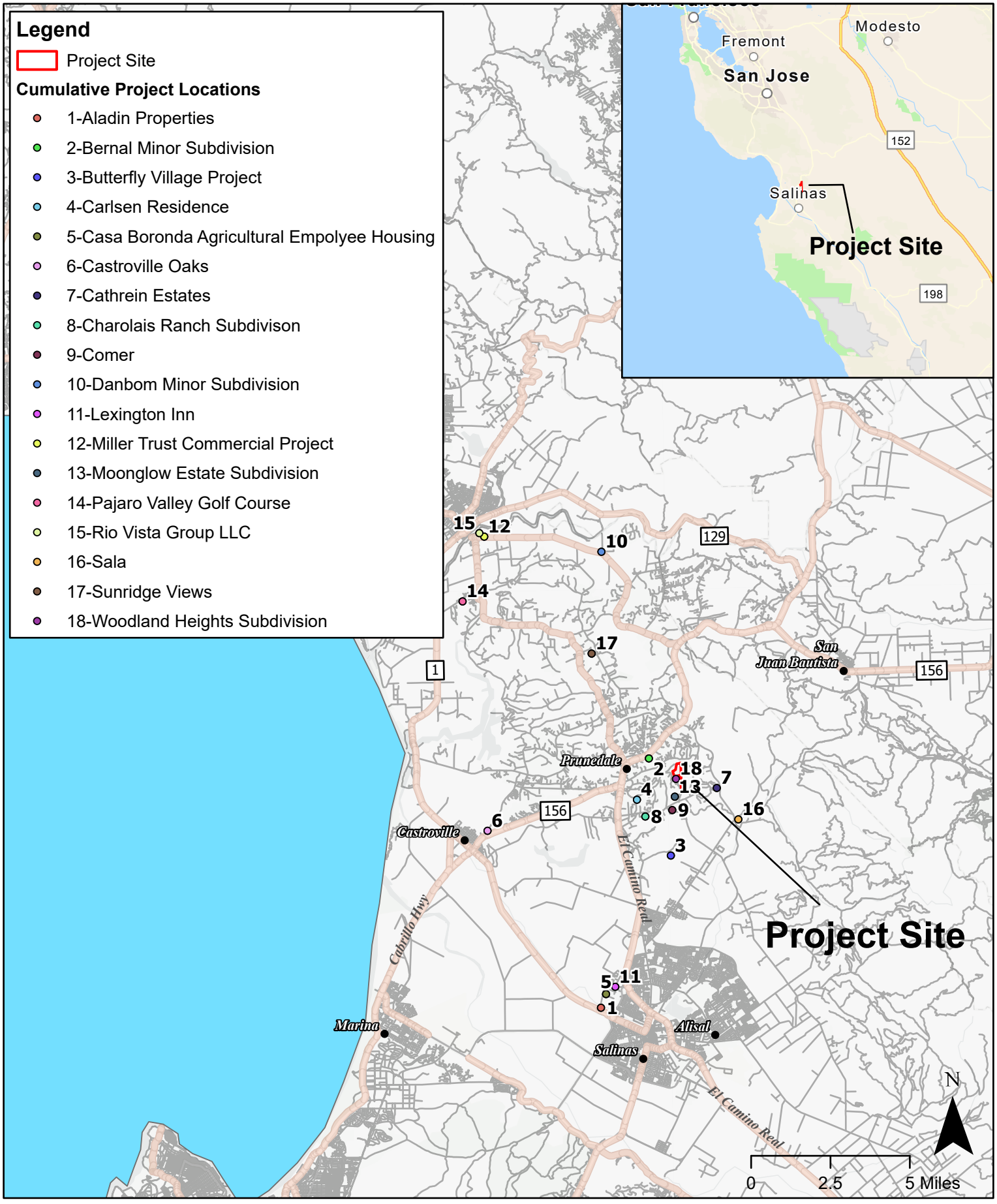
An EIR need only evaluate the cumulative effects that would result from the project (CEQA Guidelines Sec. 15130(a)(1)). CEQA further provides that the discussion of cumulative effects shall reflect the severity of the impacts and their likelihood of occurrence. The discussion need not provide the same level of detail as provided for the effects directly attributable to the project (CEQA Guidelines Sec. 15130(b)). The cumulative analysis is guided by the standards of practicality and reasonableness.

5.2.1 APPROACH

CEQA Guidelines Sec. 15130 allows for one of two methods for determining cumulative projects: 1) a list of past, present, and probable future projects producing related or cumulative impacts; or 2) a summary of projections contained in an adopted general plan or in a prior environmental document which has been certified and described or evaluated regional or area-wide conditions contributing to the cumulative impact.

For the purposes of this EIR, the list approach is used to address cumulative impacts . As required by CEQA, the cumulative analysis presented in this chapter identifies the impacts of the Project that could contribute, when considered together with effects of other past, present, and reasonably foreseeable related projects, to a potentially considerable cumulative impact. Construction-related impacts of a project are typically short-term and therefore have a relatively narrow window of time related to those past, present, and probable future projects that could contribute to a potentially significant cumulative impact.

The geographic area considered in this analysis includes the North County area. **Table 5-1** includes a list of past, present, and reasonably foreseeable projects considered in this cumulative analysis. The locations of the cumulative projects are provided in **Figure 5-1**.



Cumulative Project Locations

Date	Scale	Figure
6/29/2022	1:250,000	5-1

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

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Table 5-1
Cumulative Project List in the North County Area

No.	Project	Size/Use
1	Bernal Minor Subdivision	3 residential units
2	Bradshaw	6 residential units
3	Butterfly Village Project	1,147 residential and commercial units
4	Carlsen Estates	36 residential units
5	Casa Boronda Agricultural Employee Housing Project	75 residential unit complex
6	Castroville Oaks	90 residential units and 125-unit apartment complex
7	Cathrein Estates	28 residential units
8	Charolais Ranch Subdivision	26 residential units
9	Comer	1 residential unit and educational building
10	Danbom Minor Subdivision	5 residential units
11	Desmond	10 residential units
12	Gorman	6 residential units
13	Gray Eagle	29 residential units
14	Lexington Inn	Commercial
15	Magallan	4 residential units
16	Miller Trust Commercial Project	Commercial complex
17	Moonglow Estates	15 residential units
18	Pajaro Valley Golf Course	174 residential units
19	Rio Vista Group LLC	4 residential apartment units
20	Sala	3 residential units
21	Sobel Development	Commercial
22	Sunridge View Subdivision	10 residential units and senior citizens unit
23	Terra Linda	25 residential units
24	Woodland Heights	19 residential units

Source: County of Monterey HCD Planning Department, 2022.

5.2.2 AESTHETICS

The Proposed Project, in combination with other cumulative development would continue to urbanize the North County area. The overall change in the visual character of the Project area from mostly undeveloped land to approximately 19 single-family residential lots on 47.5 acres would result in a permanent, but visually subtle, change in the area. Although the proposed subdivision would increase the residential development in the area, the development would be consistent with the Low-Density Residential land use designation. Moreover, the Proposed Project includes conservation/scenic easements which would preserve natural space within the Project site (see **Figure 3-9**). These easements would contribute to efforts to maintain the rural nature of surrounding area. Given the topography of the site and surrounding area, and dense vegetation, the Proposed Project would not substantially obstruct scenic views for sensitive viewers in the Project area. Furthermore, the Proposed Project would be required to comply with all policies in the Monterey County General Plan and the North County Area Plan which impose strict guidelines to ensure limited impact of visual character.

Buildout of the Proposed Project, in combination with other cumulative projects, could potentially result in cumulative impacts due to changes in the visual character of the surrounding area. These effects, however, are not anticipated to be considerable. As previously discussed, change in visual character as perceived from common public viewing areas would be unlikely due to topography, dense vegetation, and policies that govern development in the North County area. **As a result, the Proposed Project, when considered with other**

cumulative projects, would not result in a cumulatively considerable impact. No mitigation measures are necessary.

5.2.3 AIR QUALITY

The Monterey Bay Air Resources District ("MBARD") considers a land use project to have a significant cumulative impact if the project's emissions are not accommodated in the Air Quality Management Plan ("AQMP") or if localized carbon monoxide ("CO") hotspots exceed State and Federal ambient air quality standards under cumulative traffic conditions. The air pollutant emissions resulting from the Proposed Project would contribute incrementally to overall increases in regional emissions due to other cumulative development. A Determination of Consistency with the Air Quality Management Plan is used to define the cumulative impacts of a proposed project on regional air quality.

The Association of Monterey Bay Area Governments ("AMBAG") is responsible for determining consistency of the Project with the AQMP. AMBAG (December 2006) in 2006 determined that the Proposed Project was consistent with the AQMP in effect at that time (see **Appendix C**). As identified in **Section 4.2, Air Quality,** the Proposed Project would not exceed AMBAGs housing forecast. Therefore, the Proposed Project's emissions are accommodated in the AQMP. Moreover, the Proposed Project would not generate substantial increases in traffic such that there would be an adverse level of service ("LOS") related effect, which could cause localized air quality impacts. The Proposed Project would not exceed air quality standards at any of the studied intersection locations in the cumulative condition. As discussed in **Section 4.2, Air Quality**, the Proposed Project would not result in a cumulatively considerable net increase in any criteria pollutant during construction. Construction-generated emissions would be short-term and temporary in duration. **Therefore, the Proposed Project would result in a cumulatively considerable impact. No mitigation measures are necessary.**

5.2.4 BIOLOGICAL RESOURCES

The Proposed Project site contains maritime chaparral, a sensitive habitat that supports mainly locally endemic species. This habitat type has an extremely restricted distribution, and five (5) different special-status plant species were identified within the maritime chaparral habitat. In addition, numerous special-status wildlife species typically associated with maritime chaparral and oak woodland are known or have the potential to occur within the project site.

The cumulative development identified in **Table 5-1** is relatively geographically isolated from the Project site due to existing residential development and the Highway 101 corridor, thereby limiting biological interaction. The Project, together with the cumulative development, is unlikely to impact wildlife corridors or result in habitat fragmentation. The proposed conservation areas associated with the Project incorporate significant portions of the maritime chaparral habitat within the site. Furthermore, mitigation proposed in **Section 4.3, Biological Resources**, would ensure the currently declining maritime chaparral located on the Project site would remain a viable community.

The property is generally surrounded by rural residential uses to the north, south, east, and west, including a 19-lot subdivision to the south. The conservation easements in conjunction with the adjacent relatively undeveloped areas provide a stable, sustainable environment for the continued existence of the sensitive habitats and the special-status species they support independent of other projects within the region. **Therefore,**

the Proposed Project would not result in a cumulatively considerable impact. No additional mitigation measures are necessary.

5.2.5 CULTURAL AND TRIBAL RESOURCES

The fragmented distribution of cultural resources in the County, together with their fragility, makes these resources particularly sensitive to incremental loss associated with land use changes, development, and time. The Proposed Project, when combined with other proposed, planned, reasonably foreseeable, and approved projects in Monterey County, could impact known and unknown cultural resources associated with Native American use and occupation of the area, as well as historic resources. Implementation of any project that contributes to these continued losses and impacts would further limit those resources, even if the resource can be scientifically studied and appropriately recorded.

Cumulative impacts related to cultural resources could occur where excavation or construction activities uncover buried historical, archeological, or paleontological resources. As discussed in **Section 4.4, Cultural and Tribal Resources**, the Proposed Project site does not contain any known historical or archeological resources. Implementation of **Mitigation Measure CR-2a** would ensure that indirect effects to previously unknown or buried resources are minimized to a less than significant level. Implementation of this mitigation would contribute to the Project's cumulative effect. Further, any new development within the North County area would be required to adhere to local, regional, State, and Federal requirements related to cultural and tribal resources as part of the CEQA process. **These development impacts would be mitigated at a project level, and therefore the Proposed Project's contribution would be less than considerable. No additional mitigation measures are necessary.**

5.2.6 ENERGY

The Proposed Project would result in an increase in energy demand. When considered with other projects this would constitute a cumulative effect. This effect would be addressed through compliance with local and State energy policies such as California Renewable Energy Standards, California Building Code, and CalGreen Standards (Title 24), which would ensure that there would not be the wasteful or inefficient use of energy. Projects that include development of large buildings or other structures that could have the potential to consume energy in an inefficient manner would have the potential to contribute to a cumulative impact. Projects that would mostly include construction, such as transportation infrastructure, could also contribute to a cumulative impact. However, when considering local and state energy conservation policies, these projects typically would not involve substantial operational energy use. Therefore, they could not result in a cumulatively considerable impact. As for energy demand associated with increased traffic, projects would adhere to increasing vehicle efficiency standards, reducing energy consumption and potential cumulative impacts. **The Proposed Project, therefore, would not result in a cumulatively considerable impact. No mitigation measures are necessary.**

5.2.7 GEOLOGY AND SOILS

Cumulative impacts related to geology and soils could occur where regional development patterns place structures and occupants in areas susceptible to geological hazards. A jurisdiction's general plan process includes the mapping of such areas to direct development patterns away from hazardous locations or to identify where special studies, and architectural and engineering measures would be required to ensure building safety.

Regional geological concerns include seismic ground cracking, intense seismic shaking, soil liquefaction, slope stability, and soil shrinking/swelling.

Seismic activity within California places structures and persons in areas that are susceptible to seismic ground shaking. Strict building code regulations are in place to ensure that structures properly account for seismic shaking and other seismically related hazards. Compliance with mandatory building code regulations would prevent a significant cumulative impact associated with placing new structures on land susceptible to geologic hazards. The Proposed Project would comply with these established policies and implement project-specific mitigation (i.e., **Mitigation Measures GS-1** through **GS-3**) (see **Section 4.6, Geology and Soils**). **Therefore, the Proposed Project would not result in a cumulatively considerable impact. No additional mitigation measures are necessary**.

5.2.8 GREENHOUSE GAS EMISSIONS

Given the significant adverse environmental effects associated with anthropogenic climate change, increased greenhouse gas ("GHG") emissions have the potential to result in cumulatively considerable air quality impacts. Simply stated, GHG impacts are cumulative impacts; therefore, the assessment of significance is based on a determination of whether the GHG emissions from a project represent a cumulatively considerable contribution to the global atmosphere.

If a project exceeds the identified significance thresholds, its contribution of GHG emissions would be cumulatively considerable. **Section 4.7, Greenhouse Gas Emissions**, evaluated the Proposed Project's potential GHG related impacts. Annual GHG emissions would not exceed the significance threshold of 1,100 $MTCO_2e$/year; therefore, the Project would not result in GHG emissions that would have a significant impact. Additionally, the Proposed Project would comply with applicable GHG-reduction plans, policies, and regulations. **Therefore, the Proposed Project's GHG emissions would not result in a considerably cumulative impact. No mitigation measures are necessary**.

5.2.9 HAZARDS AND HAZARDOUS MATERIALS

Cumulative impacts related to hazards and hazardous materials could occur where development patterns place structures and persons in proximity to significant sources of safety hazards or hazardous materials, emissions, or where regional patterns develop new cumulatively hazardous sources near sensitive receptors.

The Proposed Project could result in potential hazardous materials impacts in connection with the demolition of the existing on-site structures and site's historic agricultural use. These impacts would be addressed through the implementation of **Mitigation Measures HZ-2a** through **HZ-2b**. Moreover, the Proposed Project would require the use and temporary storage of hazardous materials. While the Proposed Project would not contribute directly to significant hazards, the inadvertent or accidental release of hazardous materials during construction and operation would contribute to potential cumulative impacts. However, the use, transport, and storage of hazardous materials is highly regulated and existing regulations exist to ensure that potential impacts would be minimized to acceptable levels. As a result, the Proposed Project, when considered with other cumulative projects, would not result in a cumulatively considerable impact. **Compliance with existing regulations governing hazards and hazardous material and the implementation of project-specific mitigation measures would ensure that the Proposed Project would not result in a cumulatively considerable impact. No additional mitigation measures are necessary.**

5.2.10 HYDROLOGY AND WATER QUALITY

While individually insignificant, development within North Monterey County has resulted in significant cumulative impacts in terms of hydrology and water quality. More specifically, development has resulted in net groundwater overdraft and water quality impacts related to nitrate loading. The effects of groundwater overdraft are addressed separately below (see *water supply* discussion). Due to declining levels of groundwater, numerous well failures have been documented by County of Monterey. These failures have subsequently resulted in deeper wells being drilled in order to meet existing demands. Additionally, in localized areas of North Monterey County, the groundwater water aquifer and seawater transition zone have been adversely affected due to net groundwater overdraft resulting in increased saltwater intrusion.

The anticipated residential buildout of the projects identified in **Table 5-1** has the potential to result in cumulatively considerable impacts in terms of hydrology and water quality. Specifically, development under the cumulative project scenario would result in an increase in impervious surfaces and thereby has the potential to increase peak stormwater runoff. Increases in stormwater runoff due to Project development would, however, be negligible as runoff would be retained on-site. Future development of the Project site would include drainage facilities in accordance with all local and state regulations and would not result in significant impacts to hydrology or flooding conditions. As analyzed under Project-specific conditions, increased stormwater runoff due to increased impervious surfaces has the potential to result in increased soil erosion and sedimentation. Implementation of Project-specific mitigations identified in **Section 4.9 Hydrology and Water Quality** would minimize impacts associated with Project development to a less-than-significant level. Therefore, the Proposed Project would not contribute to a cumulatively considerable impact warranting mitigation.

Development under the cumulative project scenario has the potential to adversely affect water quality in the Project vicinity. Specifically, cumulative development and increases in localized runoff could introduce urban pollutants into the drainage system, impacting water quality. The detention-retention basins associated with the Proposed Project would allow groundwater infiltration while removing heavy metals and other pollutants before entering the groundwater. The onsite drainage facilities and standard best management practices, in addition to Project specific mitigation, would avoid offsite, cumulative water quality impacts. Project development also has the potential to adversely affect groundwater quality due to nitrate loading. Groundwater contamination due to nitrate loading, while individually insignificant, has the potential to be cumulatively considerable. As a result, nitrate loading analyses are required to identify whether a project has the potential to contribute to an existing cumulative impact. Nitrate loading within 2,500 feet of the Project site is limited, although areas of North Monterey County have been subject to extensive water quality impacts due to nitrate loading. Moreover, the Nitrate Analysis conducted by Questa Engineering Corporation concluded that the Project would not have a significant impact on the water quality and would not exceed applicable drinking water standards.

The Proposed Project would not result in a cumulatively considerable impact. The effects of groundwater overdraft are discussed separately under *Water Supply,* below. No additional mitigation measures are necessary.

5.2.11 LAND USE, POPULATION, AND HOUSING

The Proposed Project is consistent with the Monterey County General Plan and North County Area Plan. Future residential development of the Project site would be subject to further review by the County as part of

the building permit process, which would ensure that the Proposed Project meets the goals and policies in the Monterey County General Plan and North County Area Plan for rural residential development. The Proposed Project would be consistent with the zoning provisions applicable to the Project site; therefore, the Project would result in a less than significant land use impact. Cumulative development would also be subject to the County's development review process. As the Proposed Project is consistent with relevant County of Monterey policies adopted for the purposes of mitigating or avoiding a significant environmental effect and no significant land use impacts were identified, the Project would not combine with other similar projects to create or exacerbate a significant impact. **Therefore, the Proposed Project would not result in a cumulatively considerable impact. No mitigation measures are necessary**.

5.2.12 NOISE AND VIBRATION

Noise generated by the Proposed Project, as perceived at nearby land uses, would be primarily associated with increases in vehicle traffic on area roadways. **Section 4.11, Noise and Vibration**, evaluated the noise impacts based on the 2007 noise assessment prepared by Illingworth and Rodkin, which was based on the results of a traffic analysis prepared by Hexagon Transportation Consultants. The noise generated by traffic would be 44 dBA L_{eq}, and equal to exiting peak-hour noise levels measured near the existing 19-residential lot subdivision south of the Project site. The Proposed Project was also evaluated under a 'worst-case scenario' where the Project's traffic would increase the overall hourly L_{eq} by 3 dBA to 47 dBA L_{eq}. This noise level increase would be barely perceptible and considered less than significant. Furthermore, due to the rural nature of the Project site and surrounding area, existing noise levels at the Project site would be well below the County's acceptable exterior noise level limit of 55 dBA for new residential housing, and noise levels would not be expected to substantially increase over existing conditions. The Proposed Project's contribution to traffic noise would be below 3 dBA which is generally considered to be the threshold of perceptibility for noise level changes. Moreover, as future development in the region and corresponding traffic volumes along area roadways increase, the Project's contribution to cumulative increases in traffic noise levels would be anticipated to decline.

Based on the above discussion, the Proposed Project would not result in a cumulatively considerable impact. No mitigation measures are necessary.

5.2.13 PUBLIC SERVICES

Regional development creates cumulative demand on all aspects of public services by increasing the number of residents, occupants, and visitors to the area.

5.2.13.1 Fire and Police Protection Services

The Proposed Project, along with other development projects would increase demand for fire and police protection services. As discussed in **Section 4.12, Public Services**, the Proposed Project would increase the population by 51 new persons, an increase that would not require the expansion of new facilities or staffing. Nor would the increase in persons negatively impact response times of emergency service providers. The Project would comply with all applicable fire and building safety codes and would include road improvements to ensure adequate emergency access. Development projects in the North County area would also be required to comply with fire and safety codes and adapt design to enable adequate emergency access. **Therefore, the Proposed Project would not result in a cumulatively considerable impact. No mitigation measures are necessary.**

5.2.13.2 Schools

The Proposed Project would increase demand for school facilities beyond existing school capacity but would not constitute a significant impact for the purposes of CEQA. Cumulative development would similarly contribute to school enrollments, and further exacerbate facility capacities. Projects in the North County area would be required to pay school impact fees at the time of construction. Payment of these developer fees would offset any potential physical impacts because of new or expanded school facilities pursuant to Government Code Sec. 65995(e). **Therefore, the Proposed Project would not result in a cumulatively considerable impact. No mitigation measures are necessary.**

5.2.13.3 Parks and Recreation

The Proposed Project would have no impact on recreational facilities. Recreational opportunities in the North County area consist of state beaches, county parks, and special district parks. Future cumulative development is not expected to result in negative cumulative impacts on recreational services and facilities. Furthermore, projects are required to comply with Monterey County Code Sec. 19.12.010(b) which requires that a subdivider dedicate land, pay a fee in lieu thereof, or both, at the option of the County. These actions are used for local or regional community and neighborhood parks and recreational facilities. **Therefore, the Proposed Project would not result in a cumulatively considerable impact.**

5.2.13.4 Solid Waste

Cumulative development would increase the number of residents in the North County area. These residents would generate an increase demand for solid waste. Monterey Regional Waste Management District is currently operating below its maximum daily permitted disposal tonnages. The Monterey Peninsula Landfill has an estimated remaining capacity of 48 million tons and is anticipated to serve the present service area for approximately 150 years. As evaluated in **Section 4.12, Public Services**, the Proposed Project would increase solid waste production by 0.3 percent. Solid waste generate during construction would be disposed of in compliance with all applicable regulations related to solid waste (e.g., CalGreen Sec. 5.408). **Therefore, the Proposed Project would not result in a cumulatively considerable impact.**

5.2.14 TRANSPORTATION

This EIR evaluated the potential impacts associated with the Proposed Project and evaluates potential cumulative traffic impacts (see **Section 4.13, Transportation**). While the Project's incremental increase in traffic would be negligible, the Project would still add additional traffic on existing intersections and roadway segments that would operate at an unacceptable level of service under the cumulative plus project scenario. The traffic impact analysis included recommendations to address LOS related impacts associated with the Proposed Project. Although an LOS impact does not constitute a significant impact for the purposes of CEQA, the recommendations found in **Section 4.13, Transportation** would be implemented as part of the Proposed Project as a condition of approval. Due to the rural nature of the Proposed Project, mitigation measures are not available to reduce project-specific impacts, therefore this represents a significant and unavoidable impact. Although the Proposed Project would have a significant VMT-related impact, the Proposed Project would be required to pay applicable traffic impact fees in effect at the time of building permit issuance. Applicable fees include, but are not limited to, the TAMC Regional Development Impact Fee, Countywide ad hoc mitigation fees, and Pesante Road Corridor Fee. The payment of these fees would ensure that the Proposed Project, in

combination with other cumulative development, would not result in a cumulatively considerable impact. **Therefore, the Proposed Project would not result in a cumulatively considerable impact.**

5.2.15 WASTEWATER DISPOSAL

The Proposed Project would consist of the construction and operation of an on-site wastewater treatment system (i.e., septic systems). **Section 4.14, Wastewater Disposal,** evaluated potential groundwater quality impacts due to wastewater nitrate additions from proposed septic system discharges. The Proposed Project would have potentially significant impacts on groundwater quality. These impacts would, however, be reduced to a less than significant impact through incorporation of mitigation measures that would provide retention-percolation of stormwater runoff. The Proposed Project includes two (2) detention-retention facilities that can provide more than 50 percent percolation of the total stormwater runoff from the Project site.

The Proposed Project, in combination with other development projects, would not result in an increased demand for wastewater treatment services as the Project would have an on-site wastewater treatment system. **Therefore, the Proposed Project would not result in a cumulatively considerable impact. No additional mitigation measures are necessary.**

5.2.16 WATER SUPPLY

The Proposed Project, in combination with other development projects, would increase demand for groundwater resources and contribute to cumulative water impacts. As discussed in **Section 4.15, Water Supply**, the North Monterey County hydrogeologic area is considered in overdraft, and therefore, reductions in groundwater recharge would further impact the existing groundwater balance. However, the Proposed Project is located within Zone 2C of the Salinas Valley Water Project ("SVWP"). The SVWP provides long-term management and protection of groundwater resources with the objective of attaining a balanced groundwater basin. Properties within Zone 2C benefit from management efforts as there is sustainable long-term groundwater resources. The Proposed Project's impact on the groundwater basin would therefore be less than significant and further mitigated through implementation of **Mitigation Measures WS-1** through **WS-5**.

The Proposed Project would utilize the existing Woodland Heights Mutual Water Company ("WHMWC"). The existing WHMWC consist of two (2) wells, and four (4) 15,000 gallon storage tanks and currently serves 41 connections. The Proposed Project would increase the total number of connections to 60. The increase in water demand associated with the Proposed Project would represent a 50% increase in water demand on the WHMWC. As discussed in **Section 4.15, Water Supply,** the water demand for the 60 connections would equate to 30,000 gdp (21 gpm) which would be adequately supported by the existing facilities, and the development of a secondary emergency well.

Therefore, the Proposed Project would have a potentially considerable cumulative impact on water supply that would be minimized to less than significant with the implementation of project-specific mitigation measures identified in this EIR.

5.3 EFFECTS NOT FOUND TO BE SIGNIFICANT

A significant effect on the environment is generally defined as a substantial or potentially substantial adverse change in the physical environmental (CEQA Guidelines Sec. 15358). The term "environment," as used in this

definition, means the physical conditions that exist in the area that will be affected by a proposed project include land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. The area involved is the area in which significant effects would occur either directly or indirectly as a result of the project. The environment includes both natural and man-mad conditions (CEQA Guidelines Sec. 15360).

A detailed analysis and discussion of environmental topics found to have a less than significant impact are provided in **Chapter 4.0, Environmental Setting, Impacts, and Mitigation Measures**, of this EIR. Listed below are those environmental issues found to have no impact as a result of the Proposed Project. CEQA Guidelines Sec. 15128 states that an EIR shall contain a statement to briefly indicate the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail. The CEQA Guidelines indicate that such information may be included as part of the EIR in an attached copy of an Initial Study, although such a statement is not required to be attached in a copy of an Initial Study. Consistent with the requirements of CEQA Guidelines Sec. 15128, this section provides a brief explanation why certain effects were determined not to be significant.

The Proposed Project would not result in any significant adverse environmental effects to the topical CEQA resources areas identified below. As described previously, secondary (or indirect) effects associated with growth-inducement are evaluated separately (see above). The following briefly evaluates the Proposed Project's potential direct effects and explains why these effects would not be significant.

5.3.1 AESTHETICS

The Proposed Project would not significantly damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within view from a state scenic highway. The Proposed Project site is not visible from a designated or eligible State Scenic Highway. State designated Scenic Highways within Monterey County include SR 68, SR 156, and portions of SR 1 south of Monterey. Additionally, portions of SR 1, north of Monterey, and U.S. 101 are designated as eligible State Scenic Highways. The Proposed Project is located approximately two (2) miles east of SR 156 (a designated scenic highway). The segment of U.S. 101 accessible via Pesante Road is not designated as a scenic highway – nor is it eligible for designation **Therefore, there would be no impacts from the Proposed Project**.

5.3.2 AGRICULTURAL RESOURCES

The Proposed Project would not result in conversion of farmland to a non-agricultural use, conflict with Williamson Act zoning, or conflict with zoning of timberland or forest land. The 47.5-acre site is designated Other Land on the Important Farmlands Map. Currently, there are no significant active agricultural uses present within the vicinity of the Proposed Project. The site is surrounded by rural residential development. Since the site and surrounding area do not contain lands designated as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance, the Proposed Project would not result in the conversion of farmland to a non-agricultural use. Furthermore, the site is zoned for low density residential development. The site does not contain zoning for agricultural use and does not include land designated as a Timberland Production Zone ("TPZ"). No Williamson Act land, forest land, or timberland occurs within or adjacent to the project site. **Therefore, the Proposed Project would have no impact on agricultural resources**.

5.3.3 BIOLOGICAL RESOURCES

No state or federally protected wetlands occur within the Project site. In addition, the Project is not located within the boundaries of a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. **Therefore, no impact would occur.** For more information concerning potential biological resource effects associated with the Proposed Project, please refer to **Section 4.3 Biological Resources.**

5.3.4 GEOLOGY AND SOILS

The Proposed Project would have no impact on paleontological resources, sites, or unique geologic features. A review of nearly 700 known fossil localities within the County was conducted by paleontologists in 2001; 12 fossil sites were identified as having outstanding scientific value (Monterey, 2010). The Project site is not on or near any of these sites, nor does the Project site contain any unique geologic features. **Therefore, no impact would occur.**

5.3.5 HAZARDS AND HAZARDOUS MATERIALS

The Proposed Project would not entail hazardous materials usage or acutely hazardous material usage; therefore, the 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. The nearest existing or proposed school is approximately 1.75 miles from the Project site. Additionally, the Project site is not on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Sec. 65962.5. Therefore, the Project would not create a significant hazard to the public or the environment. The Project is not located within an airport land use plan and is not located in the vicinity of a private airstrip. The nearest airport, Salinas Municipal, is 12.2 miles from the site. Due to its distance from the airport, the Proposed Project would not be subject to any potential airport related hazards. The Project Site is not within any of the designated airport zones or the Community Noise Equivalent Level ("CNEL") contour zone. Furthermore, the Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. As discussed in **Section 4.12, Public Services,** the Proposed Project would increase the demand for public services (i.e., police and fire protection services) due to the introduction of new residential uses on the site. However, the Proposed Project would not impair the implementation or physically interfere with an adopted emergency response plan. Moreover, as described in **Section 4.12, Public Service,** the Proposed Project would be accommodated by existing service providers and would not impact service ratios, response times, or other performance objectives. The closest emergency evacuation route is U.S. 101 (County of Monterey, 2021), located approximately 1.75 miles west of the Project site ingress or egress of U.S. 101. **For these reasons, no impact would occur.**

5.3.6 HYDROLOGY AND WATER QUALITY

The Proposed Project does not entail altering a course of a stream or river such that the Proposed Project would impede or redirect flows. There are no streams or rivers located on-site. In addition, the introduction of impervious surfaces associated with the development of residential uses on the site would not impede or redirect flows. There would be no impact. Additionally, the Proposed Project is not located in a flood hazard zone, nor a tsunami or seiche hazard area. As a result, there would be no impact. The Proposed Project would comply with applicable water quality plans and the local sustainable groundwater management plan. **For these**

reasons, no impact would occur. For more information concerning potential water supply effects associated with the Proposed Project, please refer to **Section 4.15 Water Supply.**

5.3.7 LAND USE, POPULATION, AND HOUSING

No established residential or business communities exist within the Project site. As such, the Project would not physically divide an established community.. The Proposed Project would not result in the displacement of existing housing. **Therefore, no impact would occur.**

5.3.8 MINERAL RESOURCES

The Proposed Project would not result in the loss of availability of known mineral resources of regional or local importance. The Project site is not within a mapped California Geological Survey Mineral Resource Zone. Furthermore, the Project is consistent with the zoning designations of the Project site and would not result in any large-scale development or other activities requiring the removal of mining deposits. **Therefore, there would be no impact on mineral resources.**

5.3.9 NOISE AND VIBRATION

Groundborne vibration moves through the ground and diminishes in strength with distance. Short-term construction-related groundborne vibration or noise could be generated by tractors, trucks, and jackhammers. However, the Proposed Project would not expose persons to the generation of excessive groundborne vibration or groundborne noise. Furthermore, the Proposed Project would not create operational groundborne vibration or noise. Therefore, the Project would not result in impacts associated with these sources. Additionally, the Project is not located within an airport land use plan and is not located in the vicinity of a private airstrip. The nearest airport is located 9.5 miles to the south of the site. **Therefore, there would be no impact**.

5.3.10 PUBLIC SERVICES

The Proposed Project would incrementally increase the population in the area, which would increase the demand for recreational facilities. This incremental increase in demand for recreational facilities would not, however, increase the use of existing recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. The Project does not include recreational facilities or require the construction or expansion of recreational facilities which would have an adverse physical effect on the environment. **Therefore, the Proposed Project would have no impact.**

5.3.11 TRANSPORTATION

The Proposed Project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. The Project consists of rural subdivision and does not include public transportation, bicycle, or other pedestrian facilities. **Therefore, no impact would occur.**

5.4 SIGNIFICANT AND UNAVOIDABLE IMPACTS

The Proposed Project would result in significant impacts in the following categories, as described in this EIR: biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, noise and vibration, transportation, wastewater disposal, and water supply. All project impacts could be reduced to a less-than-significant level with implementation of mitigation identified in the EIR except potential VMT-related impacts. As identified in **Section 4.13, Transportation,** the Proposed Project would result in a significant and unavoidable VMT-related impact.

5.5 IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 15126.2[d] of the State CEQA Guidelines requires EIRs to include a discussion of significant, irreversible environmental changes that would result from project implementation. CEQA Sec. 15126.2(c) identifies irreversible environmental changes as those involving a large commitment of nonrenewable resources or irreversible damage resulting from environmental accidents.

The Proposed Project consists of the development of a 19-single family residential subdivision. Irreversible changes associated with the Proposed Project include the use of nonrenewable resources during construction, including building materials (such as concrete, glass, plastic) and use of petroleum products. During the operational phase of the Proposed Project, natural gas and electricity would be used for lighting, cooling, and heating. The Proposed Project site is currently undeveloped with the exception of the three existing residences and associated infrastructure. The Proposed Project would, for all practical purposes, result in the irreversible commitment of resources for housing purposes due to the conversion of a primarily undeveloped site into a new residential subdivision.

Chapter 6. ALTERNATIVES

6.1 INTRODUCTION

CEQA Guidelines Sec. 15126.6 requires the consideration of a range of reasonable alternatives to the proposed project that could feasibly attain the basic objectives of the project. Sec. 15126.6 further states that an "EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project." CEQA further requires that the discussion focus on alternatives capable of eliminating significant adverse impacts of the project, or reducing them to a less-than-significant level, even if the alternative would not fully attain the project objectives or would be more costly. The range of alternatives discussed in an EIR is governed by the "rule of reason" that requires an EIR to evaluate only those alternatives necessary to allow a reasoned choice (CEQA Sec. 15126.6(f)). An EIR need not consider an alternative where the effects cannot be reasonably ascertained, or where implementation is remote and speculative (CEQA Sec. 15126.6(f)(3)).

6.1.1 ALTERNATIVES NOT ANALYZED IN DETAIL

6.1.1.1 Alternative Location

CEQA Guidelines Sec. 15126.6(f)(2) provides guidance regarding when it is appropriate to analyze an alternative location as part of the alternatives analysis. Alternative locations should be analyzed if the location would avoid or substantially lessen any of the significant effects of the project (CEQA Guidelines Sec. 15126.6(f)(2)(a)). Applicable case law indicates that an off-site alternative should be analyzed where significant impacts can be avoided by choosing another site. As identified below, all Project-related impacts would be reduced to a less-than-significant level through the incorporation of mitigation, where feasible; however, the Proposed Project would result in a significant and unavoidable traffic-related impact (see Impact TR-1). Because undeveloped similarly sized, residentially-zoned and privately owned parcels are not located within the immediate proximity of the Project site that are under the control of the Applicant, an alternative location alternative is not considered feasible. The proposed site is surrounded by rural residential uses, including several subdivisions that are currently in the process of being developed. Since the Applicant is unable to acquire feasible alternatives sites, an alternative location was not considered.

6.1.2 ALTERNATIVES SELECTED FOR FURTHER ANALYSIS

The following section discusses the alternatives evaluated in this EIR and the environmental effects of each. The alternatives considered in this analysis are as follows:

- No Project Alternative – No Development
- Applicant Proposed Alternative
- Modified Design Alternative
- Reduced Density Alternative

The alternatives chosen for this analysis, beyond those mandated by CEQA, were developed specifically to avoid or substantially reduce the significant impacts of the Proposed Project. As identified below, all Project-related impacts would be reduced to a less-than-significant level through the incorporation of mitigation except for significant and unavoidable Vehicle-miles Traveled ("VMT") related traffic impacts. A comparison of the impacts for each alternative is presented in **Table 6.1-1**. A substantive discussion is provided for each issue area where a proposed alternative would lessen the significance of an impact. For an alternative that would result in approximately the same level of impact (i.e., less-than-significant, less-than-significant with mitigation) as the Proposed Project, a discussion of that issue area is not necessarily provided. It is important to note, however, that certain aspects of a given alternative may minimize the extent of the impact, but may not necessarily affect the level of significance of the impact. For instance, an alternative may result in less ground-disturbing activities than the Proposed Project and thereby a corresponding reduction in construction-related effects, but the level of significant would likely remain unchanged.

Table 6.1-1
Comparison of Impacts – Project Alternatives

Impact	No Project - No Development	Applicant Proposed Project	Modified Design	Reduced Density
Aesthetics	<	<	=	<
Air Quality	<	<	<	<
Biological Resources	<	<	<	<
Cultural and Tribal Resources	<	=	=	=
Energy	<	<	<	<
Geology and Soils	<	<	<	<
Greenhouse Gas	<	<	<	<
Hazards & Hazardous Materials	<	<	=	<
Hydrology & Water Quality	<	<	<	<
Land Use, Population, and Housing	=	=	=	=
Noise	<	<	=	<
Public Services	<	<	=	<
Transportation	<	=	=	<
Wastewater Disposal	<	<	>	<
Water Supply	<	<	=	<

> Impact Greater than Project
= Impact Comparable to Project
< Impact Less than Project

6.2 SUMMARY OF PROJECT OBJECTIVES AND SIGNIFICANT IMPACTS

6.2.1 OBJECTIVES

The following are the objectives of the Proposed Project:

- To provide low-density housing in an identified residential area of the County, and on a site that is surrounded by existing residential development;
- To provide development consistent with the General Plan and zoning designations of the project site;
- To help the County meet its housing goals mandated by the State;

- To increase the economic value of the land both in terms of land value and tax revenue for the County.

6.2.2 SIGNIFICANT IMPACTS

The Proposed Project would result in potentially significant impacts in the following categories, as described in this EIR:

- Air Quality,
- Biological Resources,
- Cultural and Tribal Resources,
- Geology and Soils,
- Hazards and Hazardous Materials,
- Hydrology and Water Quality,
- Noise and Vibration,
- Transportation,
- Wastewater Disposal,
- Water Supply.

Based on the analysis contained in this EIR, all impacts would be reduced to a less-than-significant level with implementation of mitigation except for one (1) significant and unavoidable impact. As identified in **Section 4.13, Transportation,** the Proposed Project would result in a significant and unavoidable VMT-related impact. Due to the rural location of the Proposed Project, there are no feasible mitigation measures to reduce this effect to a less than significant level.

6.3 NO PROJECT ALTERNATIVE

CEQA requires the discussion of the No Project Alternative "to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project." (CEQA Guidelines Sec. 15126.6(e)(1)) The No Project Alternative analysis should discuss the existing conditions at the time the Notice of Preparation ("NOP") is prepared, as well as what would be reasonably expected to occur in the foreseeable future if the Project were not approved (CEQA Guidelines Sec. 15126.6[6][2]). The discussion of the No Project Alternative generally proceeds along one of two lines: the project site remaining in its existing undeveloped state or development of the project site under existing underlying land use designations (CEQA Guidelines Sec. 15126.6[e][3]). In certain instances, the No Project Alternative means "no build;" however, where failure to proceed with the project would not result in preservation of existing conditions, the analysis should identify the practical result of the Project's non-approval (CEQA Guidelines Sec. 15126.6[e][3][B]). Here, the No Project Alternative consists of the site remaining in its current state.

6.3.1 DESCRIPTION

This alternative consists of leaving the site in its current condition. This alternative assumes that the three (3) existing residences would remain on-site, and the property would continue to be utilized for limited agricultural purposes (i.e., livestock). This alternative would avoid both the adverse and beneficial effects of the Proposed Project. It would eliminate all the significant environmental impacts of the Proposed Project but would fail to meet any of the Project's objectives.

6.3.2 IMPACTS

This alternative would avoid the environmental impacts of the Project in the following areas: air quality, biological resources, cultural and tribal resources, geology and soils, hazards and hazardous materials, hydrology and water quality, noise and vibration, transportation, wastewater disposal, and water supply. Consistent with the Proposed Project, no impacts would occur in the topical areas of agricultural resources and mineral resources. This alternative would also avoid the short-term impacts during construction, including noise, dust, and water quality impacts, vegetation removal, and potential disturbance of buried archaeological resources.

6.3.3 SUMMARY

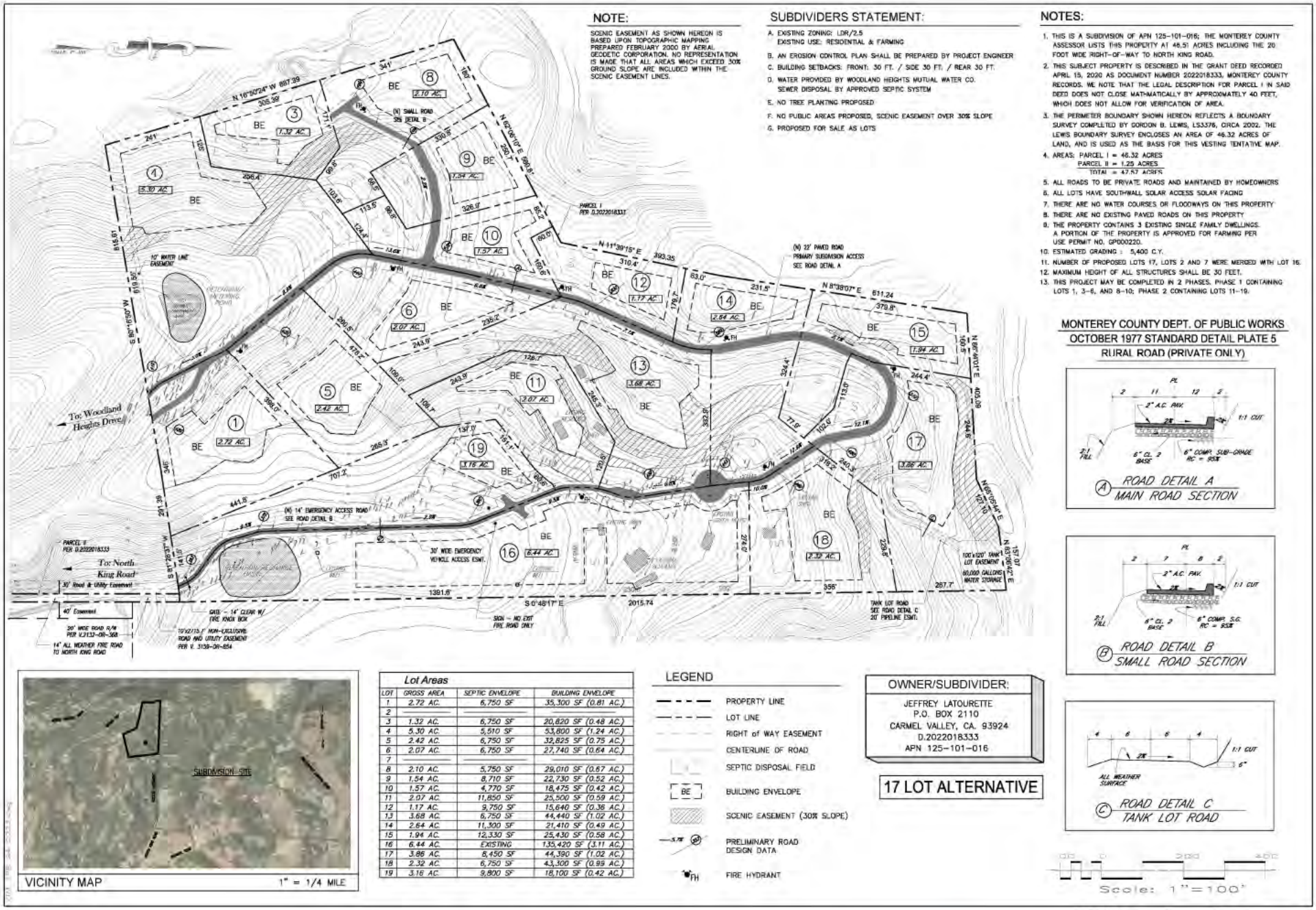
This alternative would avoid all the environmental impacts of the Proposed Project. However, this alternative would fail to meet any of the Project objectives.

6.4 APPLICANT PROPOSED ALTERNATIVE

6.4.1 DESCRIPTION

This was proposed by the Applicant and consists of reducing development on the Project site to avoid adverse impacts related to biological resources, wastewater (i.e., septic disposal), and transportation related effects. The Proposed Project would result in potentially significant impacts to biological resources (see **Section 4.3. Biological Resources**). As identified in **Section 4.14, Wastewater Disposal,** the Proposed Project would result in a potentially significant impact warranting mitigation to address potential adverse environmental effects associated with on-site wastewater disposal (i.e., septic).This alternative would result in the development of a 17-lot residential subdivision. Specifically, this alternative would result in the merging of Lot 2 and 7 with Lot 16, and the removal of one (1) existing residence onsite. This alternative would eliminate lots 2 and 7 due to wastewater disposal limitations. **Figure 6-1** includes a conceptual layout of this alternative. **Table 6.4-1** identifies the lot area, building envelope size, and septic envelope square footage for each of the proposed lots for this alternative, as compared to those of the Proposed Project (see **Table 3-1**).

Source: Monterey County Surveyors, 2023.



Lot Areas

LOT	GROSS AREA	SEPTIC ENVELOPE	BUILDING ENVELOPE
1	2.72 AC.	6,750 SF	35,300 SF (0.81 AC.)
2			
3	1.32 AC.	6,750 SF	20,620 SF (0.48 AC.)
4	5.30 AC.	5,510 SF	53,800 SF (1.24 AC.)
5	2.42 AC.	6,750 SF	32,825 SF (0.75 AC.)
6	2.07 AC.	6,750 SF	27,740 SF (0.64 AC.)
7			
8	2.10 AC.	5,750 SF	29,010 SF (0.67 AC.)
9	1.54 AC.	8,710 SF	22,730 SF (0.52 AC.)
10	1.57 AC.	4,770 SF	18,475 SF (0.42 AC.)
11	2.07 AC.	11,850 SF	25,500 SF (0.59 AC.)
12	1.17 AC.	9,750 SF	15,640 SF (0.36 AC.)
13	3.68 AC.	6,750 SF	44,440 SF (1.02 AC.)
14	2.64 AC.	11,300 SF	21,410 SF (0.49 AC.)
15	1.94 AC.	12,330 SF	25,430 SF (0.58 AC.)
16	6.44 AC.	EXISTING	135,420 SF (3.11 AC.)
17	3.86 AC.	8,450 SF	44,390 SF (1.02 AC.)
18	2.32 AC.	6,750 SF	43,300 SF (0.99 AC.)
19	3.16 AC.	9,900 SF	18,100 SF (0.42 AC.)

Applicant Proposed Alternative

Date 09/10/2024

Scale N/A

Denise Duffy & Associates, Inc.
Planning and Environmental Consulting

Figure 6-1

Table 6.4-1
Gross Lot Area, Building Envelope Square Footage, and Septic Envelope Square Footage Comparison

Lot No.	Proposed Project Lot Area (ac)	Proposed Project Building Envelope (sf)	Proposed Project Septic Envelope (sf)	Applicant Proposed Alternative Lot Area (ac)	Applicant Proposed Alternative Building Envelope (sf)	Applicant Proposed Alternative Septic Envelope (sf)
1	2.27	35,300	6,750	2.27	35,300	6,750
2	1.40	29,010	6,750	-	-	-
3	1.32	20,820	6,750	1.32	20,820	6,750
4	5.30	53,800	5,510	5.30	53,800	5,510
5	2.42	32,825	6,750	2.42	32,825	6,750
6	2.07	27,740	6,750	2.07	27,740	6,750
7	1.26	22,950	6,750	-	-	-
8	2.10	29,010	5,750	2.10	29,010	5,750
9	1.54	22,730	8,710	1.54	22,730	8,710
10	1.57	18,475	4,770	1.57	18,475	4,770
11	2.07	25,500	11,850	2.07	25,500	11,850
12	1.17	15,640	9,750	1.17	15,640	9,750
13	3.68	44,440	6,750	3.68	44,440	6,750
14	2.64	21,410	11,300	2.64	21,410	11,300
15	1.94	25,430	12,330	1.94	25,430	12,330
16	4.02	30,750	15,020	6.44	135,420	EXISTING
17	3.86	44,390	8,450	3.86	44,390	8,450
18	2.08	42,300	6,750	2.32	43,300	6,750
19	3.16	18,100	9,800	3.16	18,100	9,800

Source: MCS Inc. Vesting Tentative Map Lots 19, dated April 24, 2023. MCS Inc. Vesting Tentative Map Lots 17 dated April 24, 2023.

Development under this alternative would result in approximately the same impacts as the Proposed Project in the following areas: cultural and tribal resources, and land use, population, and housing. Consistent with the Proposed Project, no impacts would occur in the topical areas of agricultural resources and mineral resources. This alternative would lessen the extent of environmental effects as compared to the Proposed Project for the remaining resource areas. However, this alternative would still result in a significant and unavoidable traffic-related impact consistent with the Proposed Project (although this alternative would result in a slight reduction in VMT due to the development of fewer residences). The following discussion addresses only the respective issues areas that would be minimized and/or avoided under this alternative.

6.4.2 IMPACTS

6.4.2.1 Aesthetics

This alternative would minimize visual impacts. Development under this alternative, however, would not reduce the overall level of significance (i.e., less-than-significant) of impacts identified in **Section 4.1, Aesthetics.** This alternative would still result in the introduction of urban features on the site (e.g., infrastructure, residences, etc.) and would permanently alter the existing visual character of the site. Although the site would be developed, this alternative would reduce the amount of development on the site by eliminating two (2) developable lots.. Although the remaining undeveloped portions of the site would provide a visual buffer with adjacent residential uses, these areas do not differ in size from the Proposed Project. Additionally, site preparation work (i.e., grading) would be similar in comparison to the Proposed Project; therefore, the existing topography and

character of the site would not change substantially such that an adverse environmental impact would occur, or that an impact would be substantially reduced.

6.4.2.2 Air Quality

This alternative could reduce the extent of potential temporary construction-related air quality effects as compared to the Proposed Project. This alternative would also reduce operational air quality effects due to the elimination of two (2) lots and associated vehicular traffic. Like the Modified Design Alternative and Reduced Density Alternative, described below, this alternative would lessen the extent of construction-related air quality emissions due to the reduction in ground-disturbing activities associated with this alternative. This alternative would require less grading and infrastructure improvements due to the elimination of two (2) lots, and more specifically two building and septic envelopes. However, as depicted in **Figure 6-1**, Lot 16 proposes a substantially larger building envelope (combined envelopes with Lot 2 and Lot 7 which were removed), therefore grading may be substantially the same as the Proposed Project. While this alternative could result in less ground-disturbing activities than the Proposed Project, this alternative would still result in substantially the same level of environmental effects as the Proposed Project (i.e., less than significant). Like the Proposed Project, this alternative would not exceed applicable MBARD's thresholds of significance warranting the implementation of mitigation – although it is assumed that this alternative would implement standard BMPs during construction to minimize potential temporary construction-related air quality effects.

This alternative would, however, result in less operational air quality emissions as the Proposed Project. This alternative would result in fewer daily traffic trips than the Proposed Project. As a result, operational air quality emissions would be less than the Proposed Project, although the level of impact would be the same (i.e., less than significant).

6.4.2.3 Biological Resources

This alternative would minimize the extent of potential impacts to biological resources through the elimination of two (2) lots. More specifically, this alternative would avoid/minimize impacts to sensitive biological resources on the site, primarily maritime chaparral, and native oak trees. This alternative would preserve an additional 4.5 acres of mixed oak woodland habitat and 2.1 acres of maritime chaparral (see **Figure 6-1**). Due to the reduction of development proposed within mixed oak woodland habitat, this alternative would substantially lessen project impacts to this habitat type. For instance, this alternative eliminated most lots within this habitat type and the remaining lots contain isolated areas of mixed oak woodland habitat. Less grading and site clearance activities would be necessary to accommodate development of this alternative. This alternative would permit the development of 17 lots, while minimizing potential impacts to biological resources. This alternative would not, however, change the level of potential impacts (i.e., less than significant with mitigation).

6.4.2.4 Energy

As identified above, the Proposed Project would result in temporary construction-related energy use, as well as operational energy usage in connection with future residential use of the site. As identified in **Section 4.5, Energy,** the Proposed Project would not result in the inefficient or wasteful use of energy such that there would be a significant adverse impact. This alternative could reduce construction-related energy usage since this alternative entails less Project infrastructure and would eliminate two (2) lots. As a result, this alternative could entail less construction-related energy use. Anticipated energy demand associated with future residential

use of the site would also be less. While this alternative would result in less energy usage than the Proposed Project, this alternative would not change the overall significance determination (i.e., less than significant).

6.4.2.5 Geology and Soils

Development of this alternative has the potential to lessen Project-related impacts in terms of geology and soils. This alternative would require less grading and overall site disturbance to accommodate development due to the reduction of developable area (i.e., elimination of two (2) lots). Therefore, construction-related impacts associated with infrastructure improvements and residential construction would be minimized. This alternative would, however, be subject to potential seismically induced hazards. While the extent of construction-related effects would be less, this alternative would not substantially reduce potential impacts such that the level of significance of potential impacts would be less than the Proposed Project.

6.4.2.6 Greenhouse Gases

The Proposed Project would result in temporary GHG emissions associated with construction-related activities, as well as operation GHG emissions in connection with future residential use of the property (see **Section 4.7, Greenhouse Gas**). This alternative would reduce the amount of GHG emissions associated with construction-related activities and would also reduce the amount of operational GHG emissions due to the reduction in the number of developable lots. This alternative would not, however, change the overall significance determination. Impacts would remain less than significant, although actual emissions would be less than the Proposed Project.

6.4.2.7 Hazards and Hazardous Materials

As identified in **Section 4.8, Hazards and Hazardous Materials,** the Proposed Project would result in hazardous material usage during construction and operation. This alternative would result in substantially similar impacts as the Proposed Project. This alternative would require the use of hazardous materials during construction and would also result in the use of household hazardous chemicals in connection with future residential use. This alternative would also result in the demolition of existing on-site structures, which could result in hazards related to lead-based paint or asbestos containing materials. In addition, this alternative could also result in potential hazards associated with the prior agricultural use of the site. As a result, mitigation would be necessary to reduce potential impacts associated with hazardous materials. This alternative would result in less impacts than the Proposed Project due to the reduction in lots, but the overall level of impact would remain unchanged.

6.4.2.8 Hydrology and Water Quality

Development of this would minimize potential Project-related impacts in the areas of hydrology and water quality. As identified in **Section 4.9, Hydrology and Water Quality,** the Proposed Project would result in potential hydrology and water quality impacts in connection with construction and operation of the Proposed Project. In addition, the Proposed Project would also increase the rate and amount of surface runoff due to the introduction of impervious surfaces. Accordingly, this EIR identified mitigation measures to ensure that impacts would be less than significant. Although this alternative would reduce the extent of on-site development by eliminating two (2) lots, this alternative would result in substantially similar impacts and mitigation measures would be necessary to ensure that impacts would be less than significant.

6.4.2.9 Noise and Vibration

The Proposed Project would result in temporary construction-related noise and would increase noise levels on-site in connection with future residential use. This EIR identified mitigation measures to reduce temporary construction noise to ensure that construction-related noise would not exceed applicable County of Monterey noise standards. This alternative would result in fewer construction related activities compared to the Proposed Project due to the reduction in developable lots. As a result, this alternative would lessen the extent of construction noise, but the overall level of impact would remain unchanged. Mitigation measures would still be necessary to ensure that construction noise would not exceed applicable County of Monterey noise standards. During project operations, traffic noise impacts would be reduced due to the elimination of two (2) lots. The overall noise impacts of this alternative would be somewhat lower than the Proposed Project since development would be less intense and fewer people would inhabit the site. The level of significance of potential impacts would, however, remain unchanged.

6.4.2.10 Public Services

This alternative would reduce the overall demand on services by decreasing the amount of development on the site. This alternative would reduce the demand on police and fire services, schools, water, and solid waste disposal services. The overall public services and utilities impacts of this alternative would be slightly less than the Proposed Project due to the reduction in developable lot. However, the level of significance would remain unchanged (less than significant).

6.4.2.11 Transportation

This alternative would lessen the extent of potential traffic-related impacts compared to the Proposed Project. As identified in **Section 4.13, Transportation,** the Proposed Project would result in a significant and unavoidable VMT-related impact. The Proposed Project would represent a net increase of 133 daily traffic trips (excluding traffic-trips associated with the three existing residences). This would exceed OPR's recommended small project screening threshold of 110 daily trips. Projects that exceed OPR's recommended small project screening threshold are presumed to result in a significant impact warranting mitigation. Here, the Proposed Project would exceed OPR's recommended threshold and no feasible mitigation are available to reduce the Proposed Project's impact to a less than significant level due to the rural nature of the Project. This alternative would result in the elimination of two (2) parcels, and remove one (1) existing residence. The development of 17 lots residential lots (excluding the two (2) existing residences) would generate 117 new trips, which would still exceed OPR's threshold and result in a significant and unavoidable impact.

6.4.2.12 Wastewater Disposal

As identified in **Section 4.14, Wastewater Disposal,** the Proposed Project would result in a potentially significant impact due to site-soils being incapable of supporting the use of on-site septic disposal. This EIR included mitigation that would eliminate constrained lots by merging them with adjacent lots with adequate site soils. This alternative would eliminate the two problematic lots (lots 2 and 7) and would eliminate the need to merge these lots as mitigation. This EIR also identified that there was inadequate separation between several septic envelopes for lots where the septic fields were clustered (lots 4, 8, 9, and 10). This alternative would not resolve the inadequate separation between septic fields in these four (4) lots; therefore, **Mitigation Measure WDR-1b** would still be required. This alternative would result in substantially the same wastewater related

impacts associated with the Proposed Project. Impacts associated with this alternative would be less than significant with mitigation.

6.4.2.13 Water Supply

This alternative would reduce anticipated water demand as compared to the Proposed Project. The Proposed Project would result in an estimated water demand of 10.64 acre-feet per year, which would represent a net increase in water demand (as compared to historic water demand) of 5.41 acre-feet per year, however water demand is anticipated to balance (see Section 4.15). Using the same daily demand factors as illustrated in Table 4.15-4, water demand for this alternative would generate an estimated water demand of 9.52 acre-feet per year, which would represent a net increase of 4.29 acre-feet per year, see **Table 6.4-2** below.

Table 6.4-2
Water Demand Summary

Land Use	Units	Daily Demand Factor	Annual Demand (Acre-Feet)
Residential – Existing	3 DU	360 gpd/dwelling unit	1.20 ac-ft
Goat Dairy – Existing	-	3,600 gpd[a]	4.03 ac-ft
		Total Existing Water Demand	***5.23 ac-ft***
Residential - Future	17 DU	500 gpd/dwelling unit	9.52 ac-ft
		Total Future Water Demand	**9.52 ac-ft**
		Net Increase in Water Demand	**4.29 ac-ft**

Source: Questa, 2022. Water Balance Analysis.

While this alternative would reduce the amount of water demand associated with future residential use of the property, mitigation would still be warranted to ensure that future water use balances on-site. As a result, this alternative, while reducing the amount of water use, would not reduce the overall level of significance of potential water supply impacts. Nevertheless, actual water demand would be less than the Proposed Project.

6.4.3 SUMMARY

This alternative would result in approximately the same impacts as the Proposed Project in the areas of cultural and tribal resources, and land use, population, and housing. Consistent with the Proposed Project, no impacts would occur in the areas of agricultural resources and mineral resources. By decreasing the extent of development, however, this alternative would reduce overall site disturbance and construction-related impacts. This alternative would result in less ground-disturbing impacts and thereby reduce the extent of temporary construction-related impacts in the following areas: air quality, energy, greenhouse gas, hazards and hazardous materials, water quality, and noise and vibration. Furthermore, this alternative would reduce Project-related impacts in the following areas: wastewater disposal and water supply. However, impacts related to biological resources would remain less than significant. Impacts related to transportation (specially Impact TR-1) would remain significant and unavoidable. This alternative would meet the objectives of the Proposed Project by providing low density housing and contributing towards the County's mandated housing goals.

6.5 MODIFIED DESIGN ALTERNATIVE

6.5.1 DESCRIPTION

The Modified Design alternative consists of reducing overall average lot sizes to minimize potential impacts to biological resources, including maritime chaparral habitat and mixed oak woodland habitat, which contains native Coast live oak trees. This alternative involves the development of smaller lots within the center and western portions of the site in areas that have historically been disturbed in connection with prior agricultural and residential uses (see **Figure 6-2**). This alternative would locate development within previously disturbed flat or gently sloping areas of the site with direct access via Woodland Heights Roads. The Modified Design alternative assumes the development of 19 lots on approximately 20 acres of the 47.57-acre site, with an average density of 1 acre per unit. Additionally, this alternative assumes the removal of existing residences and support structures currently located on the site. The remaining portions of the site would be placed under conservation easements to ensure the permanent preservation of the undeveloped portions of the site.

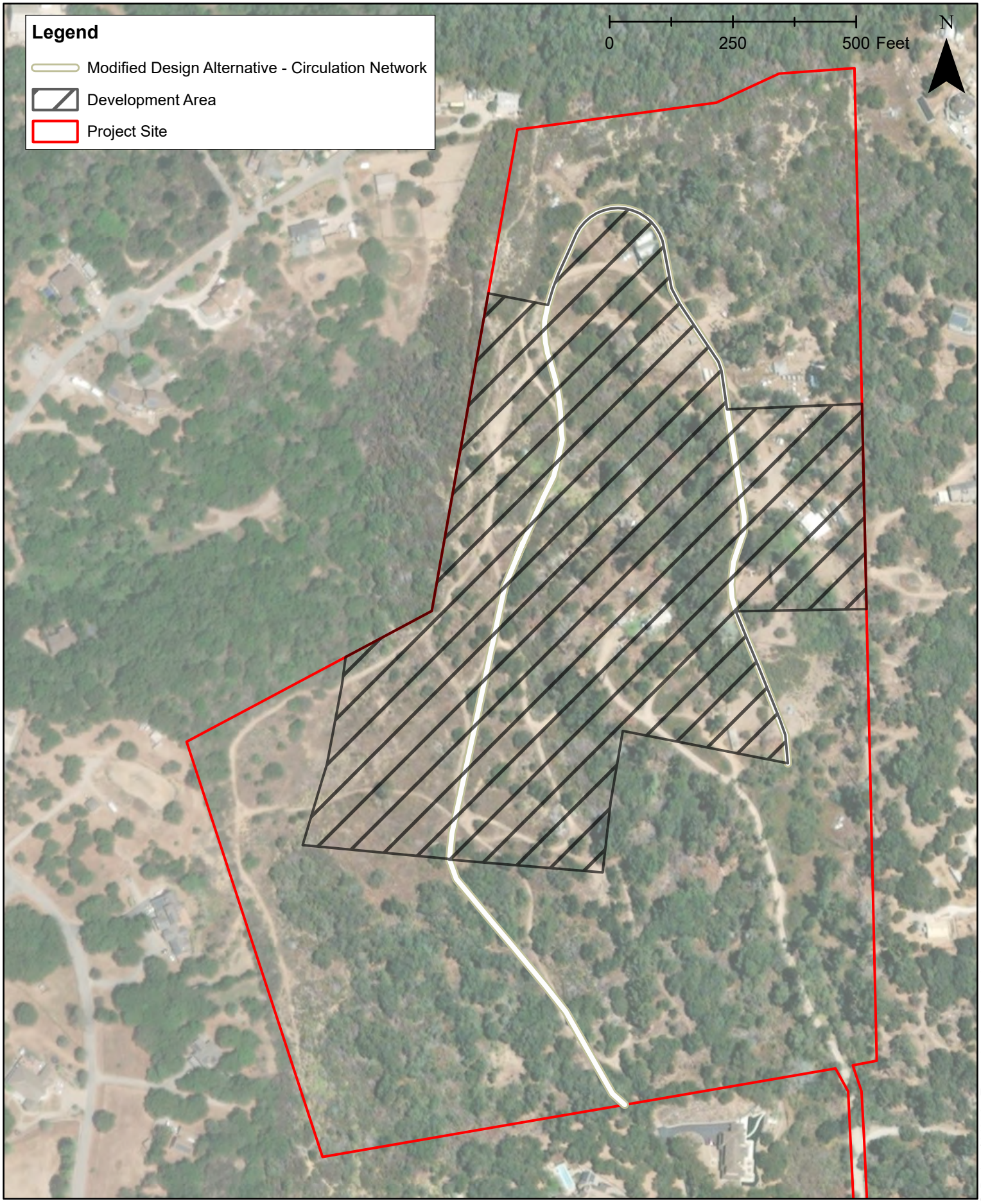
Development under this alternative would result in approximately the same impacts as the Proposed Project in the areas of: air quality, cultural and tribal resources, hazards and hazardous materials, land use, population, and housing, noise and vibration, public services, transportation, and water supply. Consistent with the Proposed Project, no impacts would occur in the areas of agricultural resources and mineral resources. Although development of this alternative would substantially lessen the extent of environmental impacts to biological resources, this alternative would not reduce the overall level of significance (i.e., less-than-significant, less-than-significant with mitigation) for each of the respective issue areas discussed below. The following discussion addresses only those areas where this alternative would reduce and/or avoid potential adverse environmental effects associated with the Proposed Project.

6.5.2 IMPACTS

6.5.2.1 Air Quality

As identified in **Section 4.2, Air Quality,** the Proposed Project would result in temporary construction-related air quality effects, as well as operational air quality impacts. This alternative would reduce the extent of potential temporary construction-related air quality effects as compared to the Proposed Project. However, this alternative would result in substantially similar operational air quality effects.

This alternative would lessen the extent of potential construction-related air quality emissions due to the reduction in ground-disturbing activities associated with this alternative. As noted above, this alternative would require less grading and infrastructure improvements since this alternative would cluster development on approximately 20 acres. While this alternative would result in less ground-disturbing activities than the Proposed Project, this alternative would still result in generally comparable environmental effects as the Proposed Project (i.e., less than significant). For instance, this alternative would result in temporary air quality effects associated with construction-related activities. This would cause localized increases in fugitive dust emissions and other associated construction-emissions. Like the Proposed Project, this alternative would not exceed applicable Monterey Bay Air Resources District's ("MBARD") thresholds of significance warranting the implementation of mitigation – although it is assumed that this alternative would also implement standard BMPs during construction to minimize potential temporary construction-related air quality effects.



Modified Density Alternative	Date 7/1/2022	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 6-2
	Scale 1:3,000		

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This alternative would also result in comparable operational air quality emissions as the Proposed Project. This alternative would generate the same number of traffic trips as the Proposed Project and would result in the development of the same number of residential lots as the Proposed Project. As a result, operational air quality emissions would be the same as the Proposed Project (i.e., less than significant). This alternative would not avoid or lessen operational air quality effects associated with the Proposed Project.

6.5.2.2 Biological Resources

As identified in **Section 4.3, Biological Resources,** the Proposed Project would impact approximately 3.6 acres of maritime chaparral habitat and would necessitate the removal of 128 Coast live oak trees and 71 Monterey pine trees. This alternative would substantially lessen the extent of potential biological impacts as compared to the Proposed Project – i.e., this alternative would reduce the amount of direct and indirect impacts to biological resource due to a reduction in the overall project footprint. However, this alternative would not change the overall significance determination (i.e., less than significant with mitigation).

Modifying the location and design of development would avoid most sensitive biological resources on-site. Specifically, this alternative would minimize potential impacts to maritime chaparral habitat and associated special-status species, as well as the mixed oak woodland (see **Figure 6-2**). This alternative would also substantially reduce the amount of tree removal as compared to the Proposed Project. Similarly, this alternative would also reduce the need to mitigate for habitat-related impacts. Further, by clustering development this alternative would avoid potential impacts to the largest continuous areas of mixed oak woodland and maritime chaparral habitats on-site. Development under the proposed alternative would be limited to approximately 20 acres and the remaining 28.83 acres would be permanently preserved via conservation easements.

This alternative would result in the removal of approximately 0.51 acres of maritime chaparral, whereas the Proposed Project would result in the removal of approximately 3.6 acres of similar habitat. Development would be primarily located within historically disturbed portions of the site that consist of degraded habitat, including areas identified as "disturbed maritime chaparral." As identified in **Section 4.3 Biological Resources**, "disturbed maritime chaparral" consists of habitat that has been historically impacted and is now dominated by non-native species, primarily annual grasses. Although development would still result in the removal of maritime chaparral habitat, this alternative would not impact the largest, intact, continuous areas of maritime chaparral. Further, as identified in **Figure 6-2** the existing disturbed areas located outside of the proposed development area contain transitioning habitat. If left undisturbed, it is likely that maritime chaparral would re-colonize this area and increase the overall area of maritime chaparral located on the project site.

Development under this alternative would also minimize impacts to mixed oak woodland habitat. The mixed oak woodland in the central and western portion of the site contains the larger stands of native coast live oak trees. Although development would still result in the removal of the mixed oak woodland habitat within this area, the majority of mixed oak woodland habitat would not be impacted under this alternative. Moreover, the remaining 28.83-acres of the site would be preserved in perpetuity under this alternative. As a result, this area would be protected, thereby ensuring that habitat fragmentation of mixed oak woodland and maritime chaparral habitats would be minimized to the greatest extent feasible. While this alternative would lessen the extent of potential impacts as compared to the Proposed Project, this alternative would not change the significance determination of project-related impacts (i.e., impacts would remain less than significant with mitigation). Nevertheless, this alternative would substantially lessen impacts to biological resources by concentrating development in areas that are less biologically sensitive.

6.5.2.3 Energy

The Proposed Project would result in temporary construction-related energy use, as well as operational energy usage in connection with future residential use of the site. As identified in **Section 4.5, Energy,** the Proposed Project would not result in the inefficient or wasteful use of energy such that there would be a significant adverse impact. This alternative would result in a minor reduction in construction-related energy usage since this alternative would entail less project infrastructure. By clustering development on approximately 20 acres, the length of the access road would be reduced. As a result, this alternative would entail less construction-related energy use. Anticipated future energy demand associated with future residential use of the site would, however, remain unchanged since this alternative would result in the same number of lots. While this alternative would result in less construction energy usage, this alternative would not change the overall impact determination (i.e., less than significant).

6.5.2.4 Geology and Soils

As identified in **Section 4.6, Geology and Soils,** the Proposed Project would result in potential temporary construction-related associated with ground-disturbing activities (i.e., erosion). Additionally, the Proposed Project could also be subject to seismically induced hazards. This alternative would lessen the extent of potential impacts as compared with the Proposed Project. As noted above, this alternative entails less ground-disturbing activities. As a result, potential impacts related to construction-related erosion would be less. This alternative would not, however, avoid potential impacts related to seismically induced hazards. While this alternative would lessen the extent of ground-disturbing activities as compared to the Proposed Project, this alternative would not change the overall significance determination. Mitigation measures would be necessary to ensure that potential impacts associated with this alternative would be less than significant.

6.5.2.5 Greenhouse Gas

The Proposed Project would result in temporary GHG emissions associated with construction-related activities, as well as operational GHG emissions in connection with future residential use of the site (see **Section 4.7, Greenhouse Gas**). Like the discussion above under *Air Quality,* this alternative would reduce construction-related emissions of greenhouse gases due to the reduced project footprint. However, this alternative would not change the overall significance determination. Impacts would remain less than significant, although actual emissions would be less than the Proposed Project.

6.5.2.6 Hydrology and Water Quality

This alternative would minimize the extent of potential drainage impacts as compared to the Proposed Project by concentrating development on approximately 20 acres. As identified in **Section 4.9, Hydrology and Water Quality,** the Project site consists of two (2) drainage basins, sub-basin 1 and sub-basin 2. This alternative would concentrate development activities exclusively in sub-basin 1. No development would occur in sub-basin 2. In addition, this alternative would also reduce impervious surface coverage by eliminating infrastructure (i.e., access road) improvements in drainage sub-basin 2. This alternative would cluster development on 20 acres and would reduce the total amount impervious surfaces on the site as compared to the Proposed Project. This alternative would, however, increase the amount of impervious surfaces within sub-basin 1. This would likely necessitate additional mitigation to ensure that drainage facilities within sub-basin 1 are designed to accommodate increased runoff associated with the concentration of development on 20 acres.

6.5.2.7 Wastewater

As identified in **Section 4.14, Wastewater Disposal,** the Proposed Project would result in potential adverse impacts due to existing site soils being incapable of accommodating on-site wastewater disposal (i.e., septic). While most of the proposed lots would have adequate site soils to accommodate future on-site wastewater disposal, County of Monterey Division of Environmental Health identified that several lots appear to be incapable of accommodating septic disposal. This alternative would potentially create additional impacts related to wastewater disposal beyond those associated with the Proposed Project. By clustering development on approximately 20 acres, this alternative would increase the concentration of septic systems in a smaller geographic area. Although problematic lots 2, 7, 14, and 16 are not within the area proposed for development under this alternative, it is reasonably conceivable that septic disposal would be constrained in this area given existing constraints for on-site septic disposal noted by County of Monterey Division of Environmental Health**.** This alternative would warrant additional analysis to determine septic viability, including additional soil samples and supporting technical analysis to determine whether: a) site soils are adequate to accommodate septic disposal; b) meet minimum horizontal setbacks; and, c) and meet Local Agency Management Program ("LAMP") for Onsite Wastewater Treatment Systems requirements, including average density requirements. As a result, this alternative would likely result in additional impacts related to wastewater disposal beyond those associated with the Proposed Project.

6.5.3 SUMMARY

This alternative would result in substantially similar adverse environmental effects and the same impacts as the Proposed Project in the following areas: aesthetics, cultural and tribal resources, hazards and hazardous materials, land use, population, and housing, noise and vibration, public services, transportation, and water supply. Consistent with the Proposed Project, no impacts would occur in the topical areas of agricultural resources and mineral resources. By decreasing the extent of development, however, this alternative would reduce the overall site disturbance and construction-related impacts, including grading, and construction dust and water quality impacts. Further, this alternative would substantially reduce potential impacts on biological resources, although the level of significance would remain unchanged. This alternative would meet the objectives of the Project by providing low density housing and contributing towards the County's mandated housing goals.

6.6 REDUCED DENSITY ALTERNATIVE

6.6.1 DESCRIPTION

This alternative consists of reducing development on the Project site to avoid significant impacts related to biological resources, on-site septic disposal, and transportation related effects. The Proposed Project would result in potentially significant impacts to biological resources (see **Section 4.3. Biological Resources**). As identified in **Section 4.14, Wastewater Disposal,** the Proposed Project would result in a potentially significant impact warranting mitigation to address potential adverse environmental effects associated with on-site wastewater disposal (i.e., septic). This alternative would specifically address the Proposed Project's significant and unavoidable VMT-related impact (see **Section 4.13, Transportation**). This alternative would result in the development of a 14-lot residential subdivision through the elimination of lots 1, 2, 4, 7, and 19. This alternative would eliminate lots 2 and 7 due to wastewater disposal limitations; lots 1, 4, and 19 would be removed to minimize biological impacts. **Figure 6-3** includes a conceptual layout of this alternative.

Development under this alternative would result in approximately the same impacts as the Proposed Project in the following areas: cultural and tribal resources, and land use, population, and housing. Consistent with the Proposed Project, no impacts would occur in the topical areas of agricultural resources and mineral resources. This alternative would substantially lessen the extent of environmental effects as compared to the Proposed Project, including eliminating the need for mitigation to address wastewater effects, as well as avoiding significant and unavoidable VMT-related traffic impacts. The following discussion addresses only the respective issues areas that would be minimized and/or avoided under this alternative.

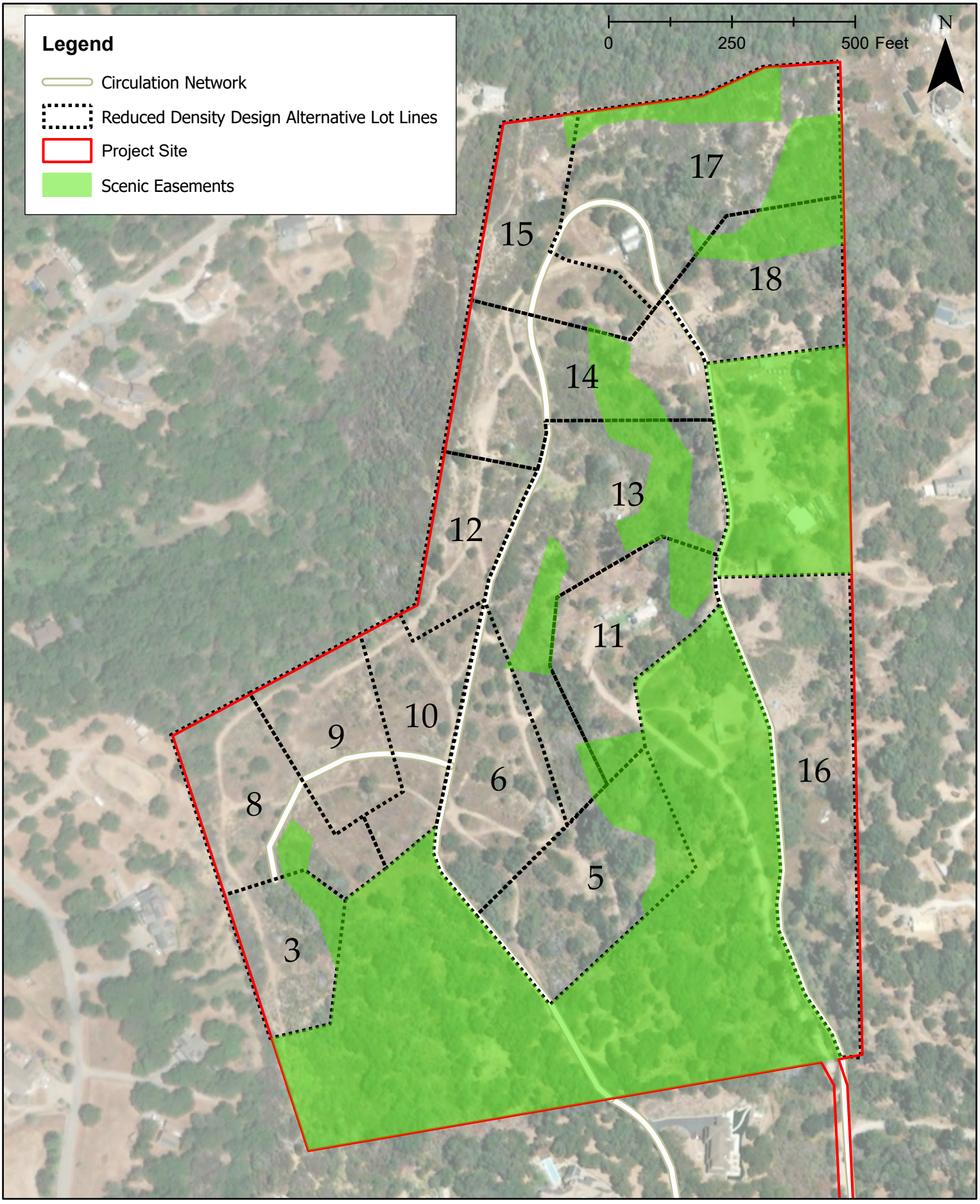
6.6.2 IMPACTS

6.6.2.1 Aesthetics

This alternative would minimize visual impacts. Development under this scenario, however, would not reduce the overall level of significance (i.e., less-than-significant) of impacts identified in **Section 4.1, Aesthetics.** This alternative would still result in the introduction of urban features on the site (e.g., infrastructure, residences, etc.) and would permanently alter the existing visual character of the site. However, the extent of development and associated site disturbance would be limited in comparison to the Proposed Project. For instance, this alternative would minimize vegetation removal thereby preserving the existing character of the site while allowing for the development of 14 residential lots. Views of this alternative as perceived from adjacent uses would also be lessened. Moreover, the remaining undeveloped portions of the site would provide a visual buffer with adjacent residential uses. Additionally, site preparation work (i.e., grading) would be limited in comparison to the Proposed Project; therefore, the existing topography and character of the site would not change substantially such that an adverse environmental impact would occur.

6.6.2.2 Air Quality

This alternative would reduce the extent of potential temporary construction-related air quality effects as compared to the Proposed Project. This alternative would also reduce operational air quality effects due to the elimination of five (5) lots and associated vehicular traffic. Like the Modified Design Alternative, this alternative would lessen the extent of construction-related air quality emissions due to the reduction in ground-disturbing activities associated with this alternative. This alternative would require less grading and infrastructure improvements due to the elimination of five (5) lots. While this alternative would result in less ground-disturbing activities than the Proposed Project, this alternative would still result in substantially the same level of environmental effects as the Proposed Project (i.e., less than significant). Like the Proposed Project, this alternative would not exceed applicable MBARD's thresholds of significance warranting the implementation of mitigation – although it is assumed that this alternative would implement standard BMPs during construction to minimize potential temporary construction-related air quality effects.



Reduced Density Alternative	Date 7/1/2022	Denise Duffy & Associates, Inc. Planning and Environmental Consulting	Figure 6-3
	Scale 1:3,000		

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This alternative would, however, result in less operational air quality emissions as the Proposed Project. This alternative would result in less daily traffic trips than the Proposed Project due to the elimination of five (5) lots. This would represent approximately 39 fewer daily trips to and from the site. As a result, operational air quality emissions would be less than the Proposed Project, although the level of impact would be the same (i.e., less than significant).

6.6.2.3 Biological Resources

This alternative would minimize the extent of potential impacts to biological resources through the elimination of five (5) lots. More specifically, this alternative would avoid/minimize impacts to sensitive biological resources on the site, primarily maritime chaparral, and native oak trees. This alternative would preserve an additional 4.5 acres of mixed oak woodland habitat and 2.1 acres of maritime chaparral (see **Figure 6-3**). Due to the reduction of development proposed within mixed oak woodland habitat, this alternative would substantially lessen project impacts to this habitat type. For instance, this alternative eliminated most lots within this habitat type and the remaining lots contain isolated areas of mixed oak woodland habitat. Less grading and site clearance activities would be necessary to accommodate development of this alternative. This alternative would permit the development of 14 lots, while minimizing potential impacts to biological resources. This alternative would not, however, change the level of potential impacts (i.e., less than significant with mitigation).

6.6.2.4 Energy

As identified above, the Proposed Project would result in temporary construction-related energy use, as well as operational energy usage in connection with future residential use of the site. As identified in **Section 4.5, Energy,** the Proposed Project would not result in the inefficient or wasteful use of energy such that there would be a significant adverse impact. This alternative would reduce construction-related energy usage since this alternative entails less Project infrastructure and would eliminate five (5) lots. As a result, this alternative entails less construction-related energy use. Anticipated energy demand associated with future residential use of the site would also be less. While this alternative would result in less energy usage than the Proposed Project, this alternative would not change the overall significance determination (i.e., less than significant).

6.6.2.5 Geology and Soils

Development of this alternative has the potential to lessen Project-related impacts in terms of geology and soils. As identified above, less grading and site disturbance would be necessary to accommodate development of this alternative due to the reduction of developable area. Therefore, construction-related impacts associated with infrastructure improvements and home-site construction would be minimized. This alternative would, however, be subject to potential seismically induced hazards. While the extent of construction-related effects would be less, this alternative would not substantially reduce potential impacts such that the level of significance of potential impacts would be less than the Proposed Project.

6.6.2.6 Greenhouse Gases

The Proposed Project would result in temporary GHG emissions associated with construction-related activities, as well as operation GHG emissions in connection with future residential use of the property (see **Section 4.7, Greenhouse Gas**). This alternative would reduce the amount of GHG emissions associated with construction-related activities and would also reduce the amount of operational GHG emissions due to the reduction in the

number of developable lots. This alternative would not, however, change the overall significance determination. Impacts would remain less than significant, although actual emissions would be less than the Proposed Project.

6.6.2.7 Hazards and Hazardous Materials

As identified in **Section 4.8, Hazards and Hazardous Materials,** the Proposed Project would result in hazardous material usage during construction and operation. This alternative would result in substantially similar impacts as the Proposed Project. This alternative would require the use of hazardous materials during construction and would also result in the use of household hazardous chemicals in connection with future residential use. This alternative would also result in the demolition of existing on-site structures, which could result in hazards related to lead-based paint or asbestos containing materials. In addition, this alternative could also result in potential hazards associated with the prior agricultural use of the site. As a result, mitigation would be necessary to reduce potential impacts associated with hazardous materials. This alternative would result in less impacts than the Proposed Project due to the reduction in lots, but the overall level of impact would remain unchanged.

6.6.2.8 Hydrology and Water Quality

Development of this would minimize potential Project-related impacts in the areas of hydrology and water quality. As identified in **Section 4.9, Hydrology and Water Quality,** the Proposed Project would result in potential hydrology and water quality impacts in connection with construction and operation of the Proposed Project. In addition, the Proposed Project would also increase the rate and amount of surface runoff due to the introduction of impervious surfaces. Accordingly, this EIR identified mitigation measures to ensure that impacts would be less than significant. Although this alternative would reduce the extent of on-site development by eliminating five (5) lots, this alternative would result in substantially similar impacts and mitigation measures would be necessary to ensure that impacts would be less than significant.

6.6.2.9 Noise and Vibration

The Proposed Project would result in temporary construction-related noise and would increase noise levels on-site in connection with future residential use. This EIR identified mitigation measures to reduce temporary construction noise to ensure that construction-related noise would not exceed applicable County of Monterey noise standards. This alternative would result in fewer construction related activities as compared to the Proposed Project due to the reduction in developable lots. As a result, this alternative would lessen the extent of construction noise, but the overall level of impact would remain unchanged. Mitigation measures would still be necessary to ensure that construction noise would not exceed applicable County of Monterey noise standards. During project operations, traffic noise impacts would be reduced due to the elimination of five (5) lots. The overall noise impacts of this alternative would be somewhat lower than those of the Proposed Project since development would be less intense and fewer people would inhabit the site. The level of significance of potential impacts would, however, remain unchanged.

6.6.2.10 Public Services

This alternative would reduce the overall demand on services by decreasing the amount of development on the site. This alternative would reduce the demand on police and fire services, schools, water, and solid waste disposal services. The overall public services and utilities impacts of this alternative would be slightly less than the Proposed Project due to the reduction in lots, but would remain less than significant.

6.6.2.11 Transportation

This alternative would substantially lessen the extent of potential traffic-related impacts as compared to the Proposed Project. As identified in **Section 4.13, Transportation,** the Proposed Project would result in a significant and unavoidable VMT-related impact. The Proposed Project would represent a net increase of 133daily traffic trips (excluding traffic-trips associated with the three existing residences). This would exceed OPR's recommended small project screening threshold of a 110 daily trips. Projects that exceed OPR's recommended small project screening threshold are presumed to result in a significant impact warranting mitigation. Here, the Proposed Project would exceed OPR's recommended threshold and no feasible mitigation are available to reduce the Proposed Project's impact to a less than significant level due to the rural location of the Project. This alternative would result in the elimination of five (5) lots. The development of 14 residential lots would generate 109 new trips, which would be below OPR's screening threshold. As a result, this alternative would avoid the Proposed Project's significant and unavoidable VMT-related impact.

6.6.2.12 Wastewater Disposal

As identified in **Section 4.14, Wastewater Disposal,** the Proposed Project would result in a potentially significant impact due to site-soils being incapable of supporting the use of on-site septic disposal. This EIR included mitigation that would eliminate problematic lots by merging them with adjacent lots with adequate site soils. This alternative would eliminate the two problematic lots (lots 2 and 7) and would eliminate the need to merge these lots as mitigation. This EIR also identified that there was inadequate separation between several septic envelopes for lots where the septic fields were clustered (lots 8 and 10). The Applicant submitted an alternative site plan configuration, which is reflected in this alternative, that includes sufficient spacing between the septic envelopes and eliminates the need for mitigation. Therefore, this alternative would substantially reduce potential wastewater related impacts associated with the Proposed Project and would eliminate the need for mitigation. Impacts associated with this alternative would be less than significant.

6.6.2.13 Water Supply

This alternative would reduce anticipated water demand as compared to the Proposed Project. The Proposed Project would result in an estimated water demand of 10.64 acre-feet per year, which would represent a net increase in water demand (as compared to historic water demand) of 5.41 acre-feet per year. This alternative would generate an estimated water demand of 7.84 acre-feet per year, which would represent a net increase of 2.61 acre-feet per year. While this alternative would reduce the amount of water demand associated with future residential use of the property, mitigation would still be warranted to ensure that future water use balances on-site. As a result, this alternative, while reducing the amount of water use on-site, would not reduce the overall level of significance of potential water supply impacts. Nevertheless, actual water demand would be less than the Proposed Project.

6.6.3 SUMMARY

This alternative would result in approximately the same impacts as the Proposed Project in the areas of cultural and tribal resources, and land use, population, and housing. Consistent with the Proposed Project, no impacts would occur in the areas of agricultural resources and mineral resources. By decreasing the extent of development, however, this alternative would reduce overall site disturbance and construction-related impacts. This alternative would result in less ground-disturbing impacts and thereby reduce the extent of temporary

construction-related impacts in the following areas: air quality, energy, greenhouse gas, hazards and hazardous materials, water quality, and noise and vibration. Furthermore, this alternative would substantially reduce Project-related impacts in the following areas: biological resources, transportation, wastewater disposal, and water supply. This alternative would meet the objectives of the Proposed Project by providing low density housing and contributing towards the County's mandated housing goals.

6.7 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

A comparison of the impacts of each alternative relative to the proposed project is presented in **Table 6-1**.

CEQA requires that an environmentally superior alternative to the proposed project be specified. In general, the environmentally superior alternative is that which minimizes the adverse impacts of the project to the greatest extent, while achieving the basic objectives of the project.

The No Project – No Development alternative could be considered the environmentally superior alternative because all adverse impacts associated with project construction and operation would be avoided. However, the No Project – No Development alternative does not satisfy the primary Project objective to provide low density housing. In addition, CEQA Guidelines section 15126.6(e)(2) states: "If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Among the remaining alternatives, the Reduced Density alternative would represent the environmentally superior alternative. This alternative would: 1) reduce the extent of potential impacts to biological resources; 2) eliminate the need for mitigation to address impacts related to wastewater disposal; 3) reduce the extent of water demand on-site; and, 4) reduce potential VMT-related traffic impacts to a less than significant level and would avoid a significant and unavoidable traffic-related impact. This alternative would also reduce impacts in other impact areas due to the elimination of five (5) lots and the corresponding reduction in development.

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Chapter 7. REFERENCES

7.1 REPORT PREPARATION

7.1.1 LEAD AGENCY

County of Monterey

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LaTourette Subdivision
Public Draft Environmental Impact Report - Appendices

SCH No. 1995123048
Monterey, California





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October 2024

Appendix A

Notice of Preparation (NOP)

COUNTY OF MONTEREY
PLANNING AND BUILDING INSPECTION DEPARTMENT
2620 1st. Avenue
MARINA, CALIFORNIA 93933

NOTICE OF PREPARATION

☐ **TO:** All Responsible Agencies

FROM: Planning & Building Inspection Department
2620 1st. Avenue
Marina, CA 93933

Subject: NOTICE OF PREPARATION of a Draft Environmental Impact Report.

The County of Monterey will be the **Lead Agency** and will prepare an Environmental Impact Report (EIR) for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. A copy of an Initial Study is not attached as one has not been prepared.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but **no later than 30 days** after receipt of this notice.

Please send your response to Luis A. Osorio, Senior Planner, at the address shown above. We will need the name for a contact person in your agency.

Project Title: **LaTOURETTE SUBDIVISION.**

Project Applicant: **Jeff and Monica LaTourette.**

Luis A. Osorio
Senior Planner
Telephone #: (831) 883-7525

Date: July 16, 2004

PROJECT LOCATION:

THE PROJECT SITE IS LOCATED NORTH OF THE PESANTE ROAD/KING ROAD INTERSECTION, APPROXIMATELY TWO MILES EAST OF HIGHWAY 101 IN THE PRUNEDALE AREA. MORE SPECIFICALLY, THE PARCEL IS LOCATED NORTH AND ADJACENT TO THE WOODLAND HEIGHTS SUBDIVISION APPROVED IN 1996 AND DEVELOPED BY THE SAME APPLICANT/PROPERTY OWNER. THE SITE IS LOCATED WITHIN THE BOUNDARIES OF THE TORO AREA PLAN. (ASSESSOR PARCEL NUMBER 125-101-016-000).

PROJECT DESCRIPTION:

THE PROPOSED PROJECT CONSISTS OF A STANDARD SUBDIVISION VESTING TENTATIVE MAP FOR THE DIVISION OF AN APPROXIMATELY 47.8ACRE PARCEL (ASSESSOR PARCEL NUMBER 125-101-016-000) INTO 19 LOTS RANGING IN SIZE FROM 1.8 TO 11 ACRES; APPROXIMATELY 5,400 CUBIC YARDS OF GRADING FOR CONSTRUCTION OF THE MAIN VEHICULAR ACCESS ROAD AND EXPANSION OF THE WOODLAND HEIGHTS MUTUAL WATER COMPANY TO PROVIDE POTABLE WATER FOR THE SUBDIVISION. THE PROJECT INCLUDES DEVELOPMENT OF ALL REQUIRED INFRASTRUCTURE.

POTENTIAL ENVIRONMENTAL EFFECTS HAVE BEEN PRELIMINARILY IDENTIFIED RELATED TO THE FOLLOWING SUBJECTS:

1. WATER RESOURCES: IMPACTS FROM THE EXTRACTION OF ADDITIONAL WATER AND THE EXPANSION OF AN EXISTING WATER DISTRIBUTION SYSTEM (WOODLAND HEIGHTS MUTUAL WATER SYSTEM) ON THE GROUNDWATER RESOURCES AND THE CAPACITY OF THE WATER SYSTEM TO CONTINUE TO PROVIDE WATER FOR EXITING COSTUMERS/RESIDENTS; IMPACTS ON OTHER WATER-RELATED ISSUES I.E. SURFACE HYDROLOGY, DRAINAGE AND WASTE-WATER DISPOSAL.

2. TRAFFIC: INCLUDING IMPACTS ON ALREADY DEFFICIENT PEAK-HOUR LEVELS OF SERVICE ALONG STATE HIGHWAY 101, IMPACT ON HIGHWAY INTERSECTIONS AND AVAILABILITY OF HIGHWAY AND LOCAL ROAD INFRASTRUCTURE TO ACCOMMODATE TRAFFIC GENERATED BY THE PROJECT; IMPACTS ON EXISTING AND FUTURE RESIDENTIAL UNITS IN THE ADJACENT WOODLAND HEIGHTS SUBDIVISION FROM THE APPLICANT'S PROPOSED VEHICULAR ACCESS THROUGH THAT SUBDIVISION'S ACCESS ROAD.

3. BIOLOGY/BOTANICAL RESOURCES: INCLUDING IMPACTS FROM ADDITIONAL STORMWATER RUNOFF ON AN EXISTING NATURAL DRAINAGE AREA BOTH INSIDE AND OUTSIDE THE PROPERTY; IMPACTS FROM POTENTIALLLY NEEDED IMPROVEMENTS TO THE WATERSHED (I.E. RETENTION/DETENTION PONDS); IMPACTS ON POTENTIALLY EXISTING SPECIAL-STATUS PLANT SPECIES PREVIOUSLY IDENTIFIED IN AN ADJOINING PARCEL; IMPACTS ON WIDLIFE CORRIDORS AND THE POTENTIAL FRAGMENTATION OF THOSE CORRIDORS/HABITATS; IMPACTS TO SENSITIVE HABITATS WITHIN, AND INDIRECT IMPACTS TO SENSITIVE HABITATS ADJACENT TO THE PROJECT SITE.

4. NOISE: INCLUDING IMPACTS ON EXISTING AND FUTURE RESIDENTIAL UNITS IN THE ADJACENT WOODLAND HEIGHTS SUBDIVISION FROM THE APPLICANT'S PROPOSED VEHICULAR ACCESS THROUGH THAT SUBDIVISION'S ACCESS ROAD.

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Manager
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Monterey, CA 93940

Mark Pereira
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Castroville, CA 95012-2546

North Monterey County Unified
School District
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Moss Landing, CA 95039

State Clearinghouse
Terry Roberts/Mosie Byrd, Plnrs
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Sacramento, CA 95814

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Pacific Bell
Ken Pina
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MOCO Water Resources Agency
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Monterey Peninsula Water
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CA Regional Water Quality
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STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Jan Boel
Acting Director

Notice of Preparation

July 20, 2004

To: Reviewing Agencies

Re: La Tourette Subdivision
SCH# 1995123048

Attached for your review and comment is the Notice of Preparation (NOP) for the La Tourette Subdivision draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Luis Osorio
County of Monterey
Planning and Building Inspection Department
2620 1st Avenue
Marina, CA 93933

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

for Terry Roberts
Scott Morgan
Project Analyst, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Bas

SCH#	1995123048
Project Title	La Tourette Subdivision
Lead Agency	Monterey County

Type	NOP Notice of Preparation
Description	The proposed project consists of a standard subdivision vesting tentative map for the division of an approximately 47.8-acre parcel into 19 lots ranging in size from 1.8 to 11 acres; approximately 5,400 cubic yards of grading for construction of the main vehicular access road and expansion of the Woodland Heights Mutual Water Company to provide potable water for the subdivision. The project includes development of all required infrastructure.

Lead Agency Contact

Name	Luis Osorio		
Agency	County of Monterey		
Phone	831-883-7525	*Fax*	
email			
Address	Planning and Building Inspection Department 2620 1st Avenue		
City	Marina	*State* CA	*Zip* 93933

Project Location

County	MONTEREY		
City	SALINAS		
Region			
Cross Streets	Pesante Road / King Road		
Parcel No.	125-101-016-000		
Township	*Range*	*Section*	*Base*

Proximity to:

Highways	101
Airports	
Railways	
Waterways	
Schools	
Land Use	

Project Issues Water Supply; Traffic/Circulation; Biological Resources; Noise

Reviewing Agencies Resources Agency; Regional Water Quality Control Board, Region 3; Department of Parks and Recreation; Native American Heritage Commission; Department of Water Resources; Department of Fish and Game, Region 3; Department of Health Services; California Highway Patrol; Caltrans, District 5; State Water Resources Control Board, Division of Water Quality

Date Received 07/20/2004 *Start of Review* 07/20/2004 *End of Review* 08/18/2004

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: Monterey **SCH#** 1995103048

Resources Agency

- [x] **Resources Agency** Nadell Gayou
- [ ] **Dept. of Boating & Waterways** Suzi Betzler
- [ ] **California Coastal Commission** Elizabeth A. Fuchs
- [ ] **Colorado River Board** Gerald R. Zimmerman
- [ ] **Dept. of Conservation** Roseanne Taylor
- [ ] **California Energy Commission** Environmental Office
- [ ] **Dept. of Forestry & Fire Protection** Allen Robertson
- [ ] **Office of Historic Preservation** Hans Kreutzberg
- [x] **Dept of Parks & Recreation** B. Noah Tilghman Environmental Stewardship Section
- [ ] **Reclamation Board** DeeDee Jones
- [ ] **Santa Monica Mountains Conservancy** Paul Edelman
- [ ] **S.F. Bay Conservation & Dev't. Comm.** Steve McAdam
- [x] **Dept. of Water Resources** Resources Agency Nadell Gayou

Fish and Game

- [ ] **Dept. of Fish & Game** Scott Flint Environmental Services Division
- [ ] **Dept. of Fish & Game 1** Donald Koch Region 1
- [ ] **Dept. of Fish & Game 2** Banky Curtis Region 2
- [x] **Dept. of Fish & Game 3** Robert Floerke Region 3
- [ ] **Dept. of Fish & Game 4** William Laudermilk Region 4
- [ ] **Dept. of Fish & Game 5** Don Chadwick Region 5, Habitat Conservation Program
- [ ] **Dept. of Fish & Game 6** Gabrina Gatchel Region 6, Habitat Conservation Program
- [ ] **Dept. of Fish & Game 6 I/M** Tammy Allen Region 6, Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M** George Isaac Marine Region

Other Departments

- [ ] **Food & Agriculture** Steve Shaffer Dept. of Food and Agriculture
- [ ] **Dept. of General Services** Robert Sleppy Environmental Services Section
- [x] **Dept. of Health Services** Wayne Hubbard Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Delta Protection Commission** Debby Eddy
- [ ] **Office of Emergency Services** John Rowden, Manager
- [ ] **Governor's Office of Planning & Research** State Clearinghouse

_____

- [x] **Native American Heritage Comm.** Debbie Treadway
- [ ] **Public Utilities Commission** Ken Lewis
- [ ] **State Lands Commission** Jean Sarino
- [ ] **Tahoe Regional Planning Agency (TRPA)** Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics** Sandy Hesnard
- [ ] **Caltrans - Planning** Terri Pencovic
- [x] **California Highway Patrol** John Olejnik Office of Special Projects
- [ ] **Housing & Community Development** Cathy Creswell Housing Policy Division

Dept. of Transportation

- [ ] **Dept. of Transportation 1** Mike Eagan District 1
- [ ] **Dept. of Transportation 2** Don Anderson District 2
- [ ] **Dept. of Transportation 3** Jeff Pulverman District 3
- [ ] **Dept. of Transportation 4** Tim Sable District 4
- [x] **Dept. of Transportation 5** David Murray District 5
- [ ] **Dept. of Transportation 6** Marc Birnbaum District 6
- [ ] **Dept. of Transportation 7** Cheryl J. Powell District 7
- [ ] **Dept. of Transportation 8** John Pagano District 8
- [ ] **Dept. of Transportation 9** Gayle Rosander District 9
- [ ] **Dept. of Transportation 10** Tom Dumas District 10
- [ ] **Dept. of Transportation 11** Mario Orso District 11
- [ ] **Dept. of Transportation 12** Bob Joseph District 12

Cal EPA

Air Resources Board

- [ ] Airport Projects Jim Lerner
- [ ] Transportation Projects Kurt Karperos
- [ ] Industrial Projects Mike Tollstrup

- [ ] **California Integrated Waste Management Board** Sue O'Leary
- [ ] **State Water Resources Control Board** Jim Hockenberry Division of Financial Assistance
- [x] **State Water Resources Control Board** Student Intern, 401 Water Quality Certification Unit Division of Water Quality
- [ ] **State Water Resouces Control Board** Steven Herrera Division of Water Rights
- [ ] **Dept. of Toxic Substances Control** CEQA Tracking Center

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1** Cathleen Hudson North Coast Region (1)
- [ ] **RWQCB 2** Environmental Document Coordinator San Francisco Bay Region (2)
- [x] **RWQCB 3** Central Coast Region (3)
- [ ] **RWQCB 4** Jonathan Bishop Los Angeles Region (4)
- [ ] **RWQCB 5S** Central Valley Region (5)
  - [ ] **RWQCB 5F** Central Valley Region (5) Fresno Branch Office
  - [ ] **RWQCB 5R** Central Valley Region (5) Redding Branch Office
- [ ] **RWQCB 6** Lahontan Region (6)
  - [ ] **RWQCB 6V** Lahontan Region (6) Victorville Branch Office
- [ ] **RWQCB 7** Colorado River Basin Region (7)
- [ ] **RWQCB 8** Santa Ana Region (8)
- [ ] **RWQCB 9** San Diego Region (9)

- [ ] **Other** _____

_____

_____

Last Updated on 05/21/04

MONTEREY BAY
Unified Air Pollution Control District
serving Monterey, San Benito, and Santa Cruz counties

AIR POLLUTION CONTROL OFFICER
Douglas Quetin

24580 Silver Cloud Court • Monterey, California 93940 • 831/647-9411 • FAX 831/647-8501

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Monterey County

Arturo Medina
San Juan Bautista

John Myers
King City

July 23, 2004

Luis Osorio
Senior Planner
Monterey County Planning
2620 1st Ave.
Marina, CA 93933

SUBJECT: NOP FOR DEIR FOR LA TOURETTE SUBDIVISION

Dear Mr. Osorio:

Staff has reviewed the referenced document and has the following recommendations for the air quality analysis:

1. Direct and indirect source emissions (VOC and NO_x) from all proposed operational activities should be quantified and assessed. VOC and NO_x emissions need not be quantified for "typical" construction activity. Staff should be consulted regarding potential construction equipment to be used on the project.

2. If project or cumulative traffic would cause LOS to decline from D or better to E or F, dispersion modeling should be undertaken to determine if carbon monoxide concentrations would violate ambient air quality standards at sensitive receptor locations.

3. Project operational and construction PM_{10} emissions should be quantified. If emissions would exceed 82 lb/day, the project would have a significant impact on air quality. However, PM_{10} modeling could be undertaken to verify or dispute this finding per the District's CEQA Air Quality Guidelines.

4. If the project might expose sensitive receptors in adjacent land uses to air quality problems such as odors or toxic air contaminants (e.g., diesel exhaust), the DEIR should include an assessment of these impacts.

5. Mitigation measures should be identified for any significant impacts on air quality. The EIR should quantify the emission reduction effectiveness of each measure, identify agencies responsible for implementation and monitoring, and conclude whether mitigation measures would reduce impacts below significance levels.

6. Project consistency with the population forecasts to be used in the 2004 Air Quality Management Plan for the Monterey Bay Region should be addressed. Consistency is used by the District to determine a project's cumulative impact on regional air quality (i.e., ozone levels). AMBAG should be contacted for a consistency determination.

The District's CEQA Air Quality Guidelines can be used to help prepare the air quality analysis. Note the Guidelines have been recently updated and are available at the District's website - www.mbuapcd.org. Please do not hesitate to call if you have any questions.

Sincerely,



Janet Brennan
Supervising Planner
Planning and Air Monitoring Division

DEPARTMENT OF TRANSPORTATION
50 HIGUERA STREET
SAN LUIS OBISPO, CA 93401-5415
PHONE (805) 549-3111
FAX (805) 549-3329
TDD (805) 549-3259
http://www.dot.gov/dist05

Flex your power!
Be energy efficient!

August 16, 2004

Mr. Luis Osorio
County of Monterey
2620 1st Avenue
Marina, CA 93933

SUBJECT: Notice of Preparation (NOP) for La Tourette Subdivision draft Environmental Impact Report (DEIR)

Dear Mr. Osorio:

The California Department of Transportation (Department) District 5 staff has reviewed the Notice of Preparation for the La Tourette Subdivision. The project will subdivide one 47.8-acre lot into 19 lots ranging in size from 1.8 to 11 acres. The Department offers its views on the scope of the draft environmental impact report with respect to traffic:

1. Since regional access from this project site will be provided US Route 101, the principal traffic study area should include the most likely Route 101 intersections. For this project, the intersection at the route and Pesante will require a thorough operational analysis.
2. The Department is responsible for the safety, operations, and maintenance of the State Highway System pursuant to the California Government Code and the California Streets and Highway Code. Therefore the Department's level of service (LOS standards should be used in the traffic analysis for the DEIR to determine the significance of any project's impact to the state system. The Department endeavors to maintain a minimum target LOS at the transition of LOS C and LOS D (i.e., not worse than C). The methodologies used to calculate the LOS for the State Highway should be consistent with the current version of the *Highway Capacity Manual* (HCM). Additionally, all LOS calculations should be included in the DEIR as an appendix and should be submitted to District 5 staff for review.
3. The project trip generation rates should be based upon the latest edition of the Institute of Transportation Engineers (ITE) *Trip Generation Report*.
4. The traffic analysis should provide existing traffic volumes within the study area, including the state highway system. This information should be based on recent traffic counts, or prior studies that are less than two years old. The LOS for the State Highway System under the existing conditions should be identified.
5. The traffic study should also include the cumulative impacts to the study area, including the intersections and US 101. The cumulative analysis should be based on a minimum 20-year horizon or the General Plan buildout forecasts. The LOS for the State Highway System under the cumulative analysis should be identified.
6. To the extent possible, the traffic analysis should include any mitigation measures proposed to allow the community to assimilate the project. The Department continues to support the Transportation Agency of Monterey County (TAMC) Nexus Study to assist in mitigating the regional impacts of development through a fair-share contribution. The Department advocates the use of such nexus studies by all lead agencies rather than relying on ad hoc calculations.

District 5 staff would like to review the DEIR, including its technical appendices, when it becomes available. If you have any other questions, please contact me at (805) 549-3099.

Sincerely,

Keith Hinrichsen
Caltrans - District 5
Development Review

Cc: D. Murray, Chief-District 5 Dev Review; R. Barnes, District 5 Traffic Ops; M. McCumsey, District 5 Reg Plng; A. Cook, TAMC.

DEPARTMENT OF TRANSPORTATION
50 HIGUERA STREET
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PHONE (805) 549-3111
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http://www.dot.gov/dist05

Flex your power!
Be energy efficient!

August 25, 2004

Mr. Luis Osorio
County of Monterey
2620 1st Avenue
Marina, CA 93933

SUBJECT: Draft Traffic Report for La Tourette Subdivision

Dear Mr. Osorio:

The California Department of Transportation (Department) District 5 staff has reviewed Draft Traffic Report (DTR) for La Tourette Subdivision. The project would subdivide one 47.8-acre lot into 19 lots ranging in size from 1.8 to 11 acres.

The Department appreciates the recognition of our comments in the mitigation measurements identified for the project. As identified in the DTR, the Department supports the pro-rata share contribution of $17,682 per peak hour trip that this study estimates to be sixteen (16). As for the contention these trips are less than significant, the Department would disagree and must view the addition of any additional trips as significant in this corridor. Additionally, the Department would appreciate notification of when the pro-rata share contribution has been received by the County and are deposited in the Developer Traffic Fees account.

On a different, but related issue, the Department would also like an update on the status of the Developer Traffic Fees Program. As we have discussed several times, accountability of these needed pro-rata share contributions identifies the fees paid by specific projects and demonstrates the local funding commitment for purposes of leveraging additional funding sources.

If you have any other questions, please contact me at (805) 549-3099.

Sincerely,

Keith Hinrichsen
Caltrans - District 5
Development Review

Cc: D. Murray, Chief-District 5 Dev Review; R. Barnes, District 5 Traffic Ops; M. McCumsey, District 5 Reg Plng; A. Cook, TAMC.

State of California – T Resources Agency / OLD SCHWARZENEGGER, Governor
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
(707) 944-5500

August 6, 2004

Mr. Luis Osorio
County of Monterey
Planning and Building
Inspection Department
2620 First Avenue
Marina, CA 93933

Dear Mr. Osorio:

La Tourette Subdivision
Pesante Road/King Road, Salinas
SCH #1995123048

The Department of Fish and Game (DFG) has reviewed the document for the subject project. Please be advised this project may result in changes to fish and wildlife resources as described in the California Code of Regulations, Title 14, Section 753.5(d)(1)(A)-(G)[1]. Therefore, if you are preparing an Initial Study and Negative Declaration for this project, a de minimis determination is not appropriate, and an environmental filing fee as required under Fish and Game Code Section 711.4(d) should be paid to the Monterey County Clerk on or before filing of the Notice of Determination for this project.

A complete assessment of the flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats, should be provided. Rare, threatened and endangered species to be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (see CEQA Guidelines, Section 15380). The assessment should identify any rare plants and rare natural communities, following DFG's Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities (revised May 8, 2000). The Guidelines are available at www.dfg.ca.gov/whdab/pdfs/guideplt.pdf

[1] http://ccr.oal.ca.gov/. Find California Code of Regulations, Title 14 Natural Resources, Division 1, Section 753

For any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream, or use material from a streambed, DFG may require a Streambed Alteration Agreement (SAA), pursuant to Section 1600 et seq. of the Fish and Game Code, with the applicant. Issuance of SAAs is subject to CEQA. DFG, as a responsible agency under CEQA, will consider the local jurisdiction's (lead agency) Negative Declaration or Environmental Impact Report for the project. The CEQA document should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for completion of the agreement. To obtain information about the SAA notification process, please access our website at www.dfg.ca.gov/1600; or to request a notification package, contact the Streambed Alteration Program at (707) 944-5520.

If you have any questions, please contact Mr. Jeff Cann, Environmental Scientist, at (831) 649-7194; or Mr. Scott Wilson, Habitat Conservation Supervisor, at (707) 944-5584.

Sincerely,

Cindy Catalano for

Robert W. Floerke
Regional Manager
Central Coast Region

cc: State Clearinghouse

Appendix B

Air Quality and Greenhouse Gas Analysis

AIR QUALITY & GREENHOUSE GAS IMPACT ASSESSMENT

FOR

LA TOURETTE SUBDIVISION PROJECT

MONTEREY COUNTY, CA

JUNE 2018

PREPARED FOR:

DENISE DUFFY & ASSOCIATES, INC.
947 CASS STREET, SUITE 5
MONTEREY, CA 93940

PREPARED BY:

AMBIENT
AIR QUALITY & NOISE CONSULTING
612 12TH STREET, SUITE 201
PASO ROBLES, CA 93446

TABLE OF CONTENTS

Introduction 1
Proposed Project Overview 1
Air Quality 1
Existing Setting 1
Regulatory Framework 11
Regulatory Attainment Designations 14
Ambient Air Quality 14
Sensitive Receptors 15
Project Impacts 16
Greenhouse Gases and Climate Change 22
Existing Setting 22
Regulatory Framework 25
Project Impacts 30
References 34

LIST OF TABLES

Table 1 Summary of Ambient Air Quality Standards 12
Table 2 NCCAB Attainment Status Designations 14
Table 3 Summary of Ambient Air Quality Monitoring Data[1] 15
Table 4 Construction Emissions - Uncontrolled 19
Table 5 Operational Emissions without Mitigation 19
Table 6 Global Warming Potential for Greenhouse Gases 23
Table 7 Construction GHG Emissions 32
Table 8 Operational GHG Emissions by Source at Project Buildout 32

LIST OF FIGURES

Figure 1 Project Location 2
Figure 2 Project Site Plan 3
Figure 3 California GHG Emissions Inventory by Scoping Plan Sector 24
Figure 4 California Black Carbon Emissions Inventory (Year 2013) 25

APPENDICES

Appendix A: Emissions Modeling & Supportive Documentation

LIST OF COMMON TERMS & ACRONYMS

AAM	Annual Arithmetic Mean
AHERA	Asbestos Hazard Emergency Response Act
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
BSC	Building Standards Code
CAAQS	California Ambient Air Quality Standards
CBSC	California Building Standards Code
CCAA	California Clean Air Act
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DPM	Diesel-Exhaust Particulate Matter or Diesel-Exhaust PM
DRRP	Diesel Risk Reduction Plan
FCAA	Federal Clean Air Act
GHG	Greenhouse Gases
HAP	Hazardous Air Pollutant
LOS	Level of Service
MBARD	Monterey Bay Air Resources District
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NCCAB	North Central Coast Air Basin
NO_x	Oxides of Nitrogen
O_3	Ozone
Pb	Lead
PM	Particulate Matter
PM_{10}	Particulate Matter (less than 10 µm)
$PM_{2.5}$	Particulate Matter (less than 2.5 µm)
ppb	Parts per Billion
ppm	Parts per Million
ROG	Reactive Organic Gases
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
sq.ft.	Square Feet
TAC	Toxic Air Contaminant
TOG	Total Organic Gases
µg/m^3	Micrograms per cubic meter
UNFCCC	United Nations Framework Convention on Climate Change
U.S. EPA	United State Environmental Protection Agency
VOC	Volatile Organic Gases

INTRODUCTION

This report provides an evaluation of potential air quality and greenhouse gas (GHG) impacts associated with the proposed La Tourette Subdivision Project (project). An overview of the existing environmental setting related to air quality and GHGs, including a summary of the existing regulatory framework has also been included. Air quality and GHG impacts were evaluated based, in part, on traffic data derived from the *LaTourette Subdivision Traffic Impact Analysis* (2017), prepared by Keith Higgins, Traffic Engineer. The analysis was prepared in accordance with Monterey Bay Air Resources District (MBARD)-recommended guidance.

PROPOSED PROJECT OVERVIEW

The proposed project is a 19-lot single-family residential subdivision. The project site encompasses a total of approximately 46.37 acres and includes three existing single-family dwellings. Primary access to the project site would be via N. King Road and Pesante Road. The project location map is included as Figure 1. The proposed project site plan is depicted in Figure 2.

AIR QUALITY

EXISTING SETTING

The proposed project is located within the North Central Coast Air Basin (NCCAB) and within the jurisdiction of the Monterey Bay Air Resources District (MBARD). Air quality in a region is affected by its topography, meteorology, and climate. These factors are discussed in more detail in the following sections:

TOPOGRAPHY

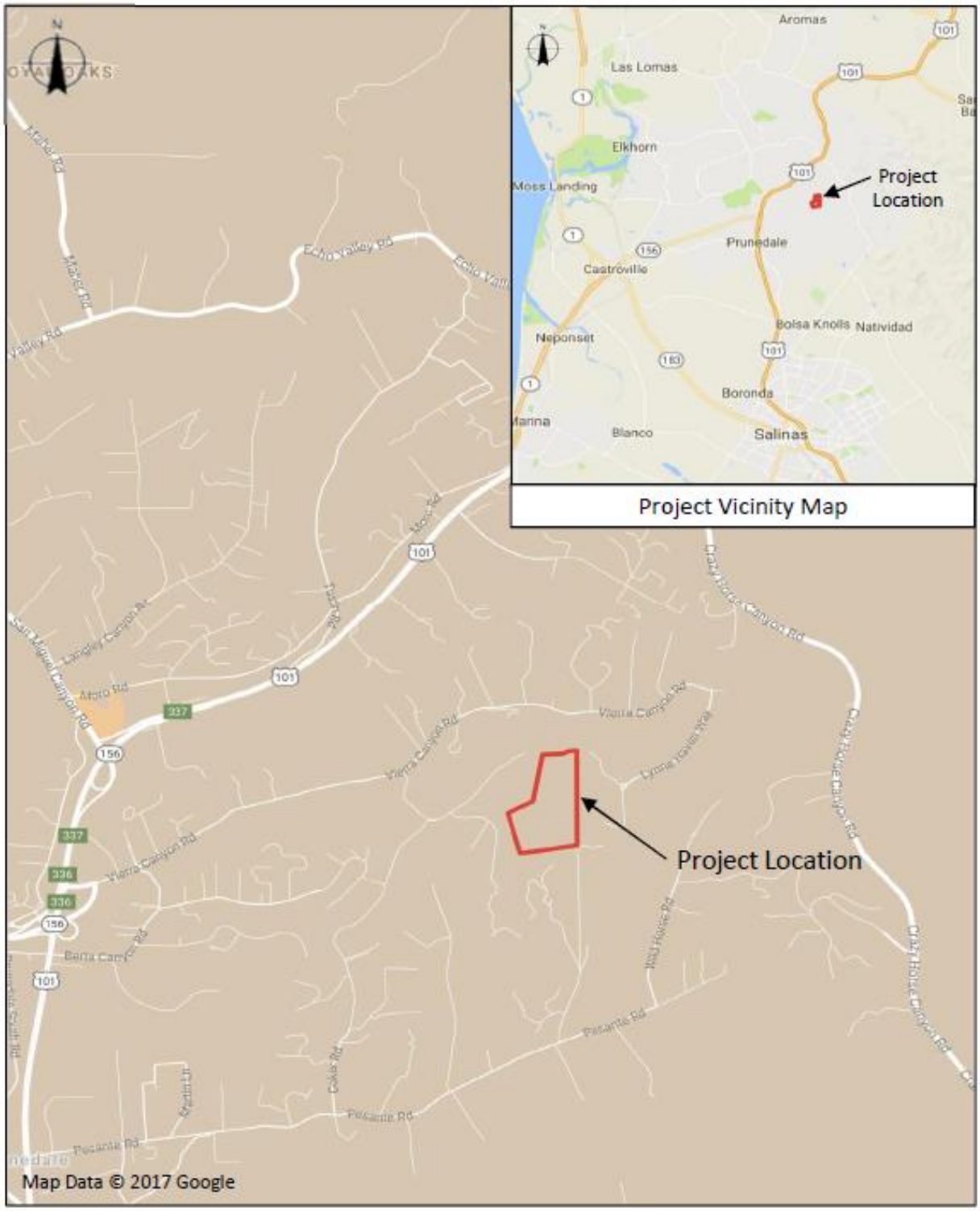
The NCCAB encompasses Santa Cruz, San Benito, and Monterey counties. The NCCAB is generally bounded by the Diablo Range to the northeast, which together with the southern portion of the Santa Cruz Mountains forms the Santa Clara Valley which extends into the northeastern tip of the NCCAB. Farther south, the Santa Clara Valley transitions into the San Benito Valley, which runs northwest-southeast and has the Gabilan Range as its western boundary. To the west of the Gabilan Range is the Salinas Valley that extends from Salinas at the northwest end to King City at the southeast end. The northwest portion of the NCCAB is dominated by the Santa Cruz Mountains.

METEOROLOGY AND CLIMATE

The climate of the NCCAB is dominated by a semi-permanent high pressure cell over the Pacific Ocean. In the summer, the dominant high pressure cell results in persistent west and northwest winds across the majority of coastal California. As air descends in the Pacific high pressure cell, a stable temperature inversion is formed. As temperatures increase, the warmer air aloft expands, forcing the coastal layer of air to move onshore producing a moderate sea breeze over the coastal plains and valleys. Temperature inversions inhibit vertical air movement and often result in increased transport of air pollutants to inland receptor areas.

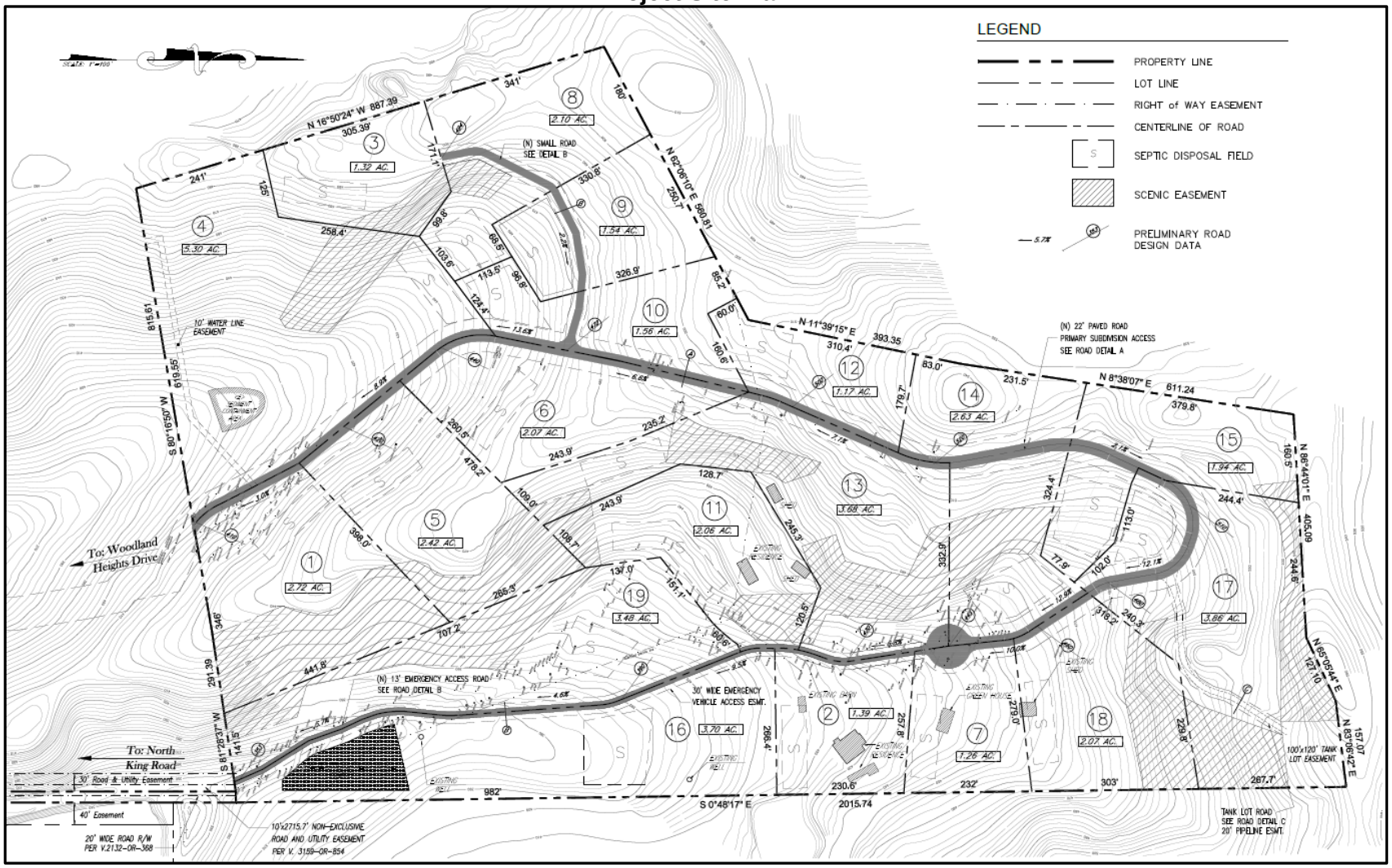
In the winter, when the high pressure cell is weakest and farthest south, the inversion associated with the Pacific high pressure cell is typically absent in the NCCAB. Air frequently flows in a southeasterly direction out of the Salinas and San Benito valleys in the NCCAB. The predominant offshore flow during this time of year tends to aid in pollutant dispersal producing relatively healthful to moderate air quality throughout the majority of the region. Conditions during this time are often characterized by afternoon and evening land breezes and occasional rain storms. However, local inversions caused by the cooling of air close to the ground can form in some areas during the evening and early morning hours.

Figure 1
Project Location



Source: Keith Higgins 2017

Figure 2
Project Site Plan



Source: Monterey County Surveyors, Inc., 2015

Winter daytime temperatures in the NCCAB typically average in the mid 50s during the day, with nighttime temperatures averaging in the low 40s. Summer daytime temperatures typically average in the 60s during the day, with nighttime temperatures averaging in the 50s. Precipitation varies within the region, but in general, annual rainfall is lowest in the coastal plain and inland valley, higher in the foothills, and highest in the mountains.

CRITERIA AIR POLLUTANTS

For the protection of public health and welfare, the Federal Clean Air Act (FCAA) required that the United States Environmental Protection Agency (U.S. EPA) establish National Ambient Air Quality Standards (NAAQS) for various pollutants. These pollutants are referred to as "criteria" pollutants because the U.S. EPA publishes criteria documents to justify the choice of standards. These standards define the maximum amount of an air pollutant that can be present in ambient air. An ambient air quality standard is generally specified as a concentration averaged over a specific time period, such as one hour, eight hours, 24 hours, or one year. The different averaging times and concentrations are meant to protect against different exposure effects. Standards established for the protection of human health are referred to as primary standards; whereas, standards established for the prevention of environmental and property damage are called secondary standards. The FCAA allows states to adopt additional or more health-protective standards. The air quality regulatory framework and ambient air quality standards are discussed in greater detail later in this report.

The following provides a summary discussion of the primary and secondary criteria air pollutants of primary concern. In general, primary pollutants are directly emitted into the atmosphere, and secondary pollutants are formed by chemical reactions in the atmosphere.

Ozone (O_3) is a reactive gas consisting of three atoms of oxygen. In the troposphere, it is a product of the photochemical process involving the sun's energy. It is a secondary pollutant that is formed when NO_X and volatile organic compounds (VOC), also referred to as reactive organic gases (ROG) react in the presence of sunlight. Ozone at the earth's surface causes numerous adverse health effects and is a criteria pollutant. It is a major component of smog. In the stratosphere, ozone exists naturally and shields Earth from harmful incoming ultraviolet radiation.

High concentrations of ground level ozone can adversely affect the human respiratory system and aggravate cardiovascular disease and many respiratory ailments. Ozone also damages natural ecosystems such as forests and foothill communities, agricultural crops, and some man-made materials, such as rubber, paint, and plastics.

Reactive Organic Gas (ROG) is a reactive chemical gas, composed of hydrocarbon compounds that may contribute to the formation of smog by their involvement in atmospheric chemical reactions. No separate health standards exist for ROG as a group. Because some compounds that make up ROG are also toxic, like the carcinogen benzene, they are often evaluated as part of a toxic risk assessment. Total Organic Gases (TOGs) includes all of the ROGs, in addition to low reactivity organic compounds like methane and acetone. ROGs and VOC are subsets of TOG.

Volatile Organic Compounds (VOC) are hydrocarbon compounds that exist in the ambient air. VOCs contribute to the formation of smog and may also be toxic. VOC emissions are a major precursor to the formation of ozone. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints.

Oxides of Nitrogen (NO_X) are a family of gaseous nitrogen compounds and is a precursor to the formation of ozone and particulate matter. The major component of NO_X, nitrogen dioxide (NO_2), is a reddish-brown gas that is toxic at high concentrations. NO_X results primarily from the combustion of fossil fuels under high temperature and pressure. On-road and off-road motor vehicles and fuel combustion are the major sources of this air pollutant.

Particulate Matter (PM), also known as particle pollution, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to

their potential for causing health problems. U.S. EPA is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. U.S. EPA groups particle pollution into three categories based on their size and where they are deposited:

- Inhalable coarse particles ($PM_{2.5}$- PM_{10}), such as those found near roadways and dusty industries, are between 2.5 and 10 micrometers in diameter. $PM_{2.5-10}$ is deposited in the thoracic region of the lungs.
- Fine particles ($PM_{2.5}$), such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air. They penetrate deeply into the thoracic and alveolar regions of the lungs.
- Ultrafine particles (UFP), are very small particles less than 0.1 micrometers in diameter largely resulting from the combustion of fossils fuels, meat, wood and other hydrocarbons. While UFP mass is a small portion of $PM_{2.5}$, its high surface area, deep lung penetration, and transfer into the bloodstream can result in disproportionate health impacts relative to their mass.

PM_{10}, $PM_{2.5}$, and UFP include primary pollutants (emitted directly to the atmosphere) as well as secondary pollutants (formed in the atmosphere by chemical reactions among precursors). Generally speaking, $PM_{2.5}$ and UFP are emitted by combustion sources like vehicles, power generation, industrial processes, and wood burning, while PM_{10} sources include these same sources plus roads and farming activities. Fugitive windblown dust and other area sources also represent a source of airborne dust.

Numerous scientific studies have linked both long- and short-term particle pollution exposure to a variety of health problems. 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. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and also acute (short-term) bronchitis, and may also increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short term exposures, although they may experience temporary minor irritation when particle levels are elevated.

Carbon Monoxide (CO) is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels and is emitted directly into the air (unlike ozone). The main source of CO is on-road motor vehicles. Other CO sources include other mobile sources, miscellaneous processes, and fuel combustion from stationary sources. Because of the local nature of CO problems, ARB and U.S. EPA designate urban areas as CO nonattainment areas instead of the entire basin as with ozone and PM_{10}. Motor vehicles are by far the largest source of CO emissions. Emissions from motor vehicles have been declining since 1985, despite increases in vehicle miles traveled, with the introduction of new automotive emission controls and fleet turnover (Caltrans 1996).

Sulfur Dioxide (SO_2) is a colorless, irritating gas with a "rotten egg" smell formed primarily by the combustion of sulfur-containing fossil fuels. However, like airborne NO_X, suspended SO_X particles contribute to the poor visibility. These SO_X particles can also combine with other pollutants to form $PM_{2.5}$. The prevalence of low-sulfur fuel use has minimized problems from this pollutant.

Lead (Pb) is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. The health effects of lead poisoning include loss of appetite, weakness, apathy, and miscarriage. Lead can also cause lesions of the neuromuscular system, circulatory system, brain, and gastrointestinal tract. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels. The use of leaded fuel has been mostly phased out, with the result that ambient concentrations of lead have dropped dramatically.

Hydrogen Sulfide (H_2S) is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations. Hydrogen sulfide is extremely hazardous in high concentrations; especially in enclosed spaces (800 ppm can cause death). OSHA regulates workplace exposure to H_2S.

Other Pollutants

The State of California has established air quality standards for some pollutants not addressed by Federal standards. The California Air Resources Board (ARB) has established State standards for hydrogen sulfide, sulfates, vinyl chloride, and visibility reducing particles. The following section summarizes these pollutants and provides a description of the pollutants' physical properties, health and other effects, sources, and the extent of the problems.

Sulfates (SO_4^{2-}) are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

The ARB sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilator function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and, due to the fact that they are usually acidic, can harm ecosystems and damage materials and property.

Visibility Reducing Particles: Are a mixture of suspended particulate matter consisting of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. The standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Vinyl Chloride (C_2H_3Cl or **VCM)** is a colorless gas that does not occur naturally. It is formed when other substances such as trichloroethane, trichloroethylene, and tetrachloro-ethylene are broken down. Vinyl chloride is used to make polyvinyl chloride (PVC) which is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

ODORS

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

The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell very 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 and in fact an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also 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.

Neither the state nor the federal governments have adopted rules or regulations for the control of odor sources. The MBARD does not have an individual rule or regulation that specifically addresses odors; however, odors would be subject to MBARD *Rule 402, Nuisance*. Any actions related to odors would be based on citizen complaints to local governments and the MBARD.

TOXIC AIR CONTAMINANTS

Toxic air contaminants (TACs) are air pollutants that may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air, but due to their high toxicity, they may pose a threat to public health even at very low concentrations. Because there is no threshold level below which adverse health impacts are not expected to occur, TACs differ from criteria pollutants for which acceptable levels of exposure can be determined and for which state and federal governments have set ambient air quality standards. TACs, therefore, are not considered "criteria pollutants" under either the FCAA or the California Clean Air Act (CCAA), and are thus not subject to National or California ambient air quality standards (NAAQS and CAAQS, respectively). Instead, the U.S. EPA and the ARB regulate Hazardous Air Pollutants (HAPs) and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology to limit emissions. In conjunction with MBARD rules, these federal and state statutes and regulations establish the regulatory framework for TACs. At the national levels, the U.S. EPA has established National Emission Standards for HAPs (NESHAPs), in accordance with the requirements of the FCAA and subsequent amendments. These are technology-based source-specific regulations that limit allowable emissions of HAPs.

Within California, TACs are regulated 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 ARB to designate substances as TACs. The following provides a summary of the primary TACs of concern within the State of California and related health effects:

Diesel Particulate Matter (DPM) was identified as a TAC by the ARB in August 1998. DPM is emitted from both mobile and stationary sources. In California, on-road diesel-fueled vehicles contribute approximately 40percent of the statewide total, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources, contributing about 3 percent of emissions, include shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations. Emissions from these sources are from diesel-fueled internal combustion engines. Stationary sources that report DPM emissions also include heavy construction, manufacturers of asphalt paving materials and blocks, and diesel-fueled electrical generation facilities (ARB 2013).

In October 2000, the ARB issued a report entitled: "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles", which is commonly referred to as the Diesel Risk Reduction Plan (DRRP). The DRRP provides a mechanism for combating the DPM problem. The goal of the DRRP is to reduce concentrations of DPM by 85 percent by the year 2020, in comparison to year 2000 baseline emissions. The key elements of the DRRP are to clean up existing engines through engine retrofit emission control devices, to adopt stringent standards for new diesel engines, and to lower the sulfur content of diesel fuel to protect new, and very effective, advanced technology emission control devices on diesel engines. When fully implemented, the DRPP will significantly reduce emissions from both old and new diesel fueled motor vehicles and from stationary sources that burn diesel fuel. In addition to these strategies, the ARB continues to promote the use of alternative fuels and electrification. As a result of these actions, DPM concentrations and associated health risks in future years are projected to decline (ARB 2013, ARB 2000).

Exposure to DPM can have immediate health effects. DPM can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, Exposure to DPM also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and

increase the frequency or intensity of asthma attacks. The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can also reduce lung function in children. In California, DPM has been identified as a carcinogen.

Acetaldehyde is a federal hazardous air pollutant. The ARB identified acetaldehyde as a TAC in April 1993. Acetaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Sources of acetaldehyde include emissions from combustion processes such as exhaust from mobile sources and fuel combustion from stationary internal combustion engines, boilers, and process heaters. A majority of the statewide acetaldehyde emissions can be attributed to mobile sources, including on-road motor vehicles, construction and mining equipment, aircraft, recreational boats, and agricultural equipment. Area sources of emissions include the burning of wood in residential fireplaces and wood stoves. The primary stationary sources of acetaldehyde are from fuel combustion from the petroleum industry (ARB 2013).

Acute exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic intoxication of acetaldehyde resemble those of alcoholism. The U.S. EPA has classified acetaldehyde as a probable human carcinogen. In California, acetaldehyde was classified on April 1, 1988, as a chemical known to the state to cause cancer (U.S. EPA 2018a; ARB 2013).

Benzene is highly carcinogenic and occurs throughout California. The ARB identified benzene as a TAC in January 1985. A majority of benzene emitted in California (roughly 88 percent) comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. These sources include on-road motor vehicles, recreational boats, off-road recreational vehicles, and lawn and garden equipment. Benzene is also formed as a partial combustion product of larger aromatic fuel components. To a lesser extent, industry-related stationary sources are also sources of benzene emissions. The primary stationary sources of reported benzene emissions are crude petroleum and natural gas mining, petroleum refining, and electric generation that involves the use of petroleum products. The primary area sources include residential combustion of various types such as cooking and water heating (ARB 2013).

Acute inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidences of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. The U.S. EPA has classified benzene as known human carcinogen for all routes of exposure (U.S. EPA 2018a).

1,3-butadiene was identified by the ARB as a TAC in 1992. Most of the emissions of 1,3-butadiene are from incomplete combustion of gasoline and diesel fuels. Mobile sources account for a majority of the total statewide emissions. Additional sources include agricultural waste burning, open burning associated with forest management, petroleum refining, manufacturing of synthetics and man-made materials, and oil and gas extraction. The primary natural sources of 1,3-butadiene emissions are wildfires (ARB 2013).

Acute exposure to 1,3-butadiene by inhalation in humans results in irritation of the eyes, nasal passages, throat, and lungs. Epidemiological studies have reported a possible association between 1,3-butadiene exposure and cardiovascular diseases. Epidemiological studies of workers in rubber plants have shown an association between 1,3-butadiene exposure and increased incidence of leukemia. Animal studies have reported tumors at various sites from 1,3-butadiene exposure. In California, 1,3-butadiene has been identified as a carcinogen.

Carbon Tetrachloride was identified by the ARB as a TAC in 1987 under California's TAC program (ARB 2013). The primary stationary sources reporting emissions of carbon tetrachloride include chemical and allied product manufacturers and petroleum refineries. In the past, carbon tetrachloride was used for dry cleaning

and as a grain-fumigant. Usage for these purposes is no longer allowed in the United States. Carbon tetrachloride has not been registered for pesticidal use in California since 1987. Also, the use of carbon tetrachloride in products to be used indoors has been discontinued in the United States. The statewide emissions of carbon tetrachloride are small (about 1.96 tons per year), and background concentrations account for most of the health risk (ARB 2013).

The primary effects of carbon tetrachloride in humans are on the liver, kidneys, and central nervous system. Human symptoms of acute inhalation and oral exposures to carbon tetrachloride include headache, weakness, lethargy, nausea, and vomiting. Acute exposures to higher levels and chronic (long-term) inhalation or oral exposure to carbon tetrachloride produces liver and kidney damage in humans. Human data on the carcinogenic effects of carbon tetrachloride are limited. Studies in animals have shown that ingestion of carbon tetrachloride increases the risk of liver cancer. In California, carbon tetrachloride has been identified as a carcinogen.

Hexavalent chromium was identified as a TAC in 1986. Sources of Hexavalent chromium include industrial metal finishing processes, such as chrome plating and chromic acid anodizing, and firebrick lining of glass furnaces. Other sources include mobile sources, including gasoline motor vehicles, trains, and ships (ARB 2013).

The respiratory tract is the major target organ for hexavalent chromium toxicity, for acute and chronic inhalation exposures. Shortness of breath, coughing, and wheezing were reported from a case of acute exposure to hexavalent chromium, while perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, and other respiratory effects have been noted from chronic exposure. Human studies have clearly established that inhaled hexavalent chromium is a human carcinogen, resulting in an increased risk of lung cancer. In California, hexavalent chromium has been identified as a carcinogen.

Para-Dichlorobenzene was identified by the ARB as a TAC in April 1993. The primary area-wide sources that have reported emissions of para-dichlorobenzene include consumer products such as non-aerosol insect repellants and solid/gel air fresheners. These sources contribute nearly all of the statewide para-dichlorobenzene emissions (ARB 2013).

Acute exposure to paradichlorobenzene via inhalation results in irritation to the eyes, skin, and throat in humans. In addition, long-term inhalation exposure may affect the liver, skin, and central nervous system in humans. The U.S. EPA has classified para-dichlorobenzene as a possible human carcinogen.

Formaldehyde was identified by the ARB as a TAC in 1992. Formaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Photochemical oxidation is the largest source of formaldehyde concentrations in California ambient air. Directly emitted formaldehyde is a product of incomplete combustion. One of the primary sources of directly-emitted formaldehyde is vehicular exhaust. Formaldehyde is also used in resins, can be found in many consumer products as an antimicrobial agent, and is also used in fumigants and soil disinfectants. The primary area sources of formaldehyde emissions include wood burning in residential fireplaces and wood stoves (ARB 2013).

Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute and chronic inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. Formaldehyde is classified as a probable human carcinogen.

Methylene Chloride was identified by the ARB as a TAC in 1987. Methylene chloride is used as a solvent, a blowing and cleaning agent in the manufacture of polyurethane foam and plastic fabrication, and as a solvent in paint stripping operations. Paint removers account for the largest use of methylene chloride in California, where methylene chloride is the main ingredient in many paint stripping formulations. Plastic product manufacturers, manufacturers of synthetics, and aircraft and parts manufacturers are stationary sources reporting emissions of methylene chloride (ARB 2013).

The acute effects of methylene chloride inhalation in humans consist mainly of nervous system effects including decreased visual, auditory, and motor functions, but these effects are reversible once exposure ceases. The effects of chronic exposure to methylene chloride suggest that the central nervous system is a potential target in humans and animals. Human data are inconclusive regarding methylene chloride and cancer. Animal studies have shown increases in liver and lung cancer and benign mammary gland tumors following the inhalation of methylene chloride. In California, methylene chloride has been identified as a carcinogen.

Perchloroethylene was identified by the ARB as a TAC in 1991. Perchloroethylene is used as a solvent, primarily in dry cleaning operations. Perchloroethylene is also used in degreasing operations, paints and coatings, adhesives, aerosols, specialty chemical production, printing inks, silicones, rug shampoos, and laboratory solvents. In California, the stationary sources that have reported emissions of perchloroethylene are dry cleaning plants, aircraft part and equipment manufacturers, and fabricated metal product manufacturers. The primary area sources include consumer products such as automotive brake cleaners and tire sealants and inflators (ARB 2013).

Acute inhalation exposure to perchloroethylene vapors can result in irritation of the upper respiratory tract and eyes, kidney dysfunction, and at lower concentrations, neurological effects, such as reversible mood and behavioral changes, impairment of coordination, dizziness, headaches sleepiness, and unconsciousness. Chronic inhalation exposure can result in neurological effects, including sensory symptoms such as headaches, impairments in cognitive and motor neurobehavioral functioning, and color vision decrements. Cardiac arrhythmia, liver damage, and possible kidney damage may also occur. In California, perchloroethylene has been identified as a carcinogen.

ASBESTOS

Asbestos is a term used for several types of naturally-occurring fibrous minerals found in many parts of California. The most common type of asbestos is chrysotile, but other types are also found in California. Serpentine rock often contains chrysotile asbestos. Serpentine rock, and its parent material, ultramafic rock, is abundant in the Sierra foothills, the Klamath Mountains, and Coast Ranges. The project site, however, is not located in an area of known ultramafic rock.

Asbestos is commonly found in ultramafic rock, including serpentine, and near fault zones. The amount of asbestos that is typically present in these rocks range from less than 1 percent up to about 25 percent, and sometimes more. Asbestos is released from ultramafic and serpentine rock when it is broken or crushed. This can happen when cars drive over unpaved roads or driveways which are surfaced with these rocks, when land is graded for building purposes, or at quarrying operations. It is also released naturally through weathering and erosion. Once released from the rock, asbestos can become airborne and may stay in the air for long periods of time.

Additional sources of asbestos include building materials and other manmade materials. The most common sources are heat-resistant insulators, cement, furnace or pipe coverings, inert filler material, fireproof gloves and clothing, and brake linings. Asbestos has been used in the United States since the early 1900's; however, asbestos is no longer allowed as a constituent in most home products and materials. Many older buildings, schools, and homes still have asbestos containing products.

Naturally-occurring asbestos was identified by ARB as a TAC in 1986. The ARB has adopted two statewide control measures which prohibits the use of serpentine or ultramafic rock for unpaved surfacing and controls dust emissions from construction, grading, and surface mining in areas with these rocks. Various other laws have also been adopted, including laws related to the control of asbestos-containing materials during the renovation and demolition of buildings.

All types of asbestos are hazardous and may cause lung disease and cancer. Health risks to people are dependent upon their exposure to asbestos. The longer a person is exposed to asbestos and the greater the intensity of the exposure, the greater the chances for a health problem. Asbestos-related disease, such as

lung cancer, may not occur for decades after breathing asbestos fibers. Cigarette smoking increases the risk of lung cancer from asbestos exposure.

REGULATORY FRAMEWORK

Air quality within the NCCAB is regulated by several jurisdictions including the U.S. EPA, ARB, and the MBARD. Each of these jurisdictions develops rules, regulations, and policies to attain the goals or directives imposed upon them through legislation. Although U.S. EPA regulations may not be superseded, both state and local regulations may be more stringent.

FEDERAL

U.S. Environmental Protection Agency

At the federal level, the U.S. EPA has been charged with implementing national air quality programs. The U.S. EPA's air quality mandates are drawn primarily from the FCAA, which was signed into law in 1970. Congress substantially amended the FCAA in 1977 and again in 1990.

Federal Clean Air Act

The FCAA required the U.S. EPA to establish NAAQS, and also set deadlines for their attainment. Two types of NAAQS have been established: primary standards, which protect public health, and secondary standards, which protect public welfare from non-health-related adverse effects, such as visibility restrictions. NAAQS are summarized in Table 1.

The FCAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The FCAA Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. The U.S. EPA has responsibility to review all state SIPs to determine conformance with the mandates of the FCAA, and the amendments thereof, and determine if implementation will achieve air quality goals. If the U.S. EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area that imposes additional control measures.

National Emission Standards for Hazardous Air Pollutants

Pursuant to the FCAA of 1970, the U.S. EPA established the National Emission Standards for Hazardous Air Pollutants. These are technology-based source-specific regulations that limit allowable emissions of HAPs.

STATE

California Air Resources Board

The ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the CCAA of 1988. Other ARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control districts and air quality management districts, establishing California Ambient Air Quality Standards (CAAQS), which in many cases are more stringent than the NAAQS, and setting emissions standards for new motor vehicles. The CAAQS are summarized in Table 1. The emission standards established for motor vehicles differ depending on various factors including the model year, and the type of vehicle, fuel and engine used.

California Clean Air Act

The CCAA requires that all air districts in the state endeavor to achieve and maintain CAAQS for Ozone, CO, SO_2, and NO_2 by the earliest practical date. The CCAA specifies that districts focus particular attention on

Table 1
Summary of Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards*	National Standards* (Primary)
Ozone (O_3)	1-hour	0.09 ppm	–
	8-hour	0.070 ppm	0.070 ppm
Particulate Matter (PM_{10})	AAM	20 µg/m^3	–
	24-hour	50 µg/m^3	150 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)	AAM	12 µg/m^3	12 µg/m^3
	24-hour	No Standard	35 µg/m^3
Carbon Monoxide (CO)	1-hour	20 ppm	35 ppm
	8-hour	9 ppm	9 ppm
	8-hour (Lake Tahoe)	6 ppm	–
Nitrogen Dioxide (NO_2)	AAM	0.030 ppm	0.053 ppm
	1-hour	0.18 ppm	0.100 ppb
Sulfur Dioxide (SO_2)	AAM	–	0.03 ppm
	24-hour	0.04 ppm	0.14 ppm
	3-hour	–	0.5 ppm (1300 µg/m^3)**
	1-hour	0.25 ppm	75 ppb
Lead	30-day Average	1.5 µg/m^3	–
	Calendar Quarter	–	1.5 µg/m^3
	Rolling 3-Month Average	–	0.15 µg/m^3
Sulfates	24-hour	25 µg/m^3	No Federal Standards
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m^3)	
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient: 0.23/kilometer-visibility of 10 miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70 percent.	

ppm=parts per million; ppb=parts per billion; AAM=Annual Arithmetic Mean; µg/m^3=micrograms per cubic meter
** For more information on standards visit :http//ww.arb.ca.gov.research/aaqs/aaqs2.pdf*
***Secondary Standard*
Source: ARB 2018c

reducing the emissions from transportation and area-wide emission sources, and the act provides districts with authority to regulate indirect sources. Each district plan is required to either (1) achieve a five percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each non-attainment pollutant or its precursors, or (2) to provide for implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both state and federal planning requirements.

California 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.

Assembly Bills 1807 & 2588 - Toxic Air Contaminants

Within California, TACs are regulated primarily through AB 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics Hot Spots Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB designates a substance as a TAC. Existing sources of TACs that are subject to the Air Toxics Hot Spots Information and Assessment Act are required to: (1) prepare a toxic emissions inventory; (2) prepare a risk assessment if emissions are significant; (3) notify the public of significant risk levels; and (4) prepare and implement risk reduction measures.

California Building Standards Code

The California Building Standards Code (CBSC), commonly referred to as Title 24, contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. Included in the CBSC are energy efficiency standards, which are commonly referred to as green building standards or CalGreen standards. The CBSC is adopted every three years by the Building Standards Commission (BSC). In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBSC was most recently updated in 2016.

MONTEREY BAY AIR RESOURCES DISTRICT

The MBARD is the agency primarily responsible for ensuring that NAAQS and CAAQS are not exceeded and that air quality conditions are maintained in the NCCAB, within which the project is located. Responsibilities of the MBARD include, but are not limited to, preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing programs and regulations required by the FCAA and the CCAA. In an attempt to achieve NAAQS and CAAQS and maintain air quality, the MBARD has most recently completed the *2008 Air Quality Management Plan (AQMP)* for achieving the state ozone standards and the *2007 Federal Maintenance Plan* for maintaining federal ozone standards (MBARD 2018b).

To achieve and maintain ambient air quality standards, the MBARD has adopted various rules and regulations for the control of airborne pollutants. The MBARD Rules and Regulations that are applicable to the proposed project include, but are not limited to, the following:

- **Rule 402 (Nuisances).** The purpose of this rule is to prohibit emissions that may create a public nuisance. Applies to any source operation that emits or may emit air contaminants or other materials.
- **Rule 426 (Architectural Coatings).** The purposed of this rule is to limit emissions of volatile organic compounds from architectural coatings.

- **Rule 425 (Use of Cutback Asphalt).** The purposed of this rule is to limit emissions of vapors of organic compounds from the use of cutback and emulsified asphalt. This rule applies to the manufacture and use of cutback, slow cure, and emulsified asphalt during paving and maintenance operations.
- **Rule 424 (NESHAP-Asbestos)** Rule 424 adopts the National Emissions Standards for Hazardous Air Pollutants contained in the Code of Federal Regulations (40 CFR Part 61) pertaining to asbestos removal and building demolitions.

REGULATORY ATTAINMENT DESIGNATIONS

The attainment status of the NCCAB is summarized in Table 2. An attainment designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A nonattainment designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation(s) was caused by an exceptional event, as defined in the criteria. Unclassified designations indicate insufficient data is available to determine attainment status.

Table 2
NCCAB Attainment Status Designations

Pollutant	State Designation [1]	National Designation
Ozone (O_3)	Nonattainment [2]	Attainment/Unclassified[3]
Inhalable Particulates (PM_{10})	Nonattainment	Attainment
Fine Attainment ($PM_{2.5}$)	Attainment	Unclassified/Attainment [4]
Carbon Monoxide (CO)	Monterey County-Attainment San Benito County-Unclassified Santa Cruz County-Unclassified	Attainment/Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Attainment/Unclassified[5]
Sulfur Dioxide (SO_2)	Attainment	Attainment[6]
Lead	Attainment	Attainment/Unclassified[7]

Notes:
1) *State designations based on 2010 to 2012 air monitoring data.*
2) *Effective July 26, 2007, the ARB designated the NCCAB a nonattainment area for the State ozone standard, which was revised in 2006 to include an 8-hour standard of 0.070 ppm.*
3) *On March 12, 2008, EPA adopted a new 8-hour ozone standard of 0.075 ppm. In April 2012, EPA designated the NCCAB attainment/unclassified based on 2009-2011 data.*
4) *This includes the 2006 24-hour standard of 35 µg/m3 and the 2012 annual standard of 12 µg/m3.*
5) *In 2012, EPA designated the entire state as attainment/unclassified for the 2010 NO_2 standard.*
6) *In June 2011, the ARB recommended to EPA that the entire state be designated as attainment for the 2010 primary SO_2 standard. Final designations to be addressed in future EPA actions.*
7) *On October 15, 2008 EPA lowered the NAAQS for lead to 0.15 µg/m^3. Final designations were made by EPA in November 2011.*

Source: ARB 2018b, MBARD 2018a.

Under the CCAA, the basin is designated as a nonattainment transitional area for the state ozone AAQS. The NCCAB is also designated a nonattainment area for the state PM_{10} AAQS. Under the FCAA, the NCCAB is currently designated attainment for the recently established eight-hour ozone federal AAQS. The NCCAB is designated either attainment or unclassified for the remaining state and federal AAQS.

AMBIENT AIR QUALITY

Air pollutant concentrations are measured at several monitoring stations in Monterey County. The "Salinas #3 Monitoring Station" is the closest representative monitoring site to the proposed project site with sufficient data to meet U.S. EPA and/or ARB criteria for quality assurance. This monitoring station monitors ambient concentrations of ozone, NO_2, CO, and $PM_{2.5}$. Ambient monitoring data for the last three years of available measurement data (i.e., 2014 through 2016) are summarized in Table 3. As depicted, state and federal standards for ozone, NO_2, CO, and $PM_{2.5}$ have not been exceeded during the past 3 years.

Table 3
Summary of Ambient Air Quality Monitoring Data[1]

	2014	2015	2016
Ozone			
Maximum concentration, ppm (1-hour/8-hour average)	0.066/0.062	0.068/0.061	0.066/0.058
Number of days state/national 1-hour standard exceeded	0/0	0/0	0/0
Number of days state/national 8-hour standard exceeded	0/0	0/0	0/0
Nitrogen Dioxide (NO_2)			
Maximum concentration, ppm (1-hour average)	38.0	33.0	33.0
Annual average	5	5	4
Number of days state/national standard exceeded	0/0	0/0	0/0
Carbon Monoxide (CO)[2]			
Maximum concentration, ppm (1-hour/8-hour average)	1.8/1.1	1.6/0.9	4.2/0.9
Number of days state/national 1-hour standard exceeded	0	0	0
Number of days state/national 8-hour standard exceeded	0	0	0
Suspended Particulate Matter ($PM_{2.5}$)			
Maximum concentration, µg/m^3 (state/national)	20.2	22.8	28.7
Annual Average	4.8	5.0	5.5
Number of days national standard exceeded (measured/calculated)[3]	0/0	0/0	0/0

ppm = parts per million by volume, µg/m^3 = micrograms per cubic meter

1. *Ambient data was obtained from the Salinas #3 Monitoring Station.*
2. *Based on data derived from U.S. EPA Monitor Values Report (2018b).*
3. *Measured days are those days that an actual measurement was greater than the standard. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day.*

Source: ARB 2018a, EPA 2018b

SENSITIVE RECEPTORS

One of the most important reasons for air quality standards is the protection of those members of the population who are most sensitive to the adverse health effects of air pollution, termed "sensitive receptors." The term sensitive receptors refer to specific population groups, as well as the land uses where individuals would reside for long periods. Commonly identified sensitive population groups are children, the elderly, the acutely ill, and the chronically ill. Commonly identified sensitive land uses would include facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Residential dwellings, schools, parks, playgrounds, childcare centers, convalescent homes, and hospitals are examples of sensitive land uses.

Nearby sensitive receptors consist of rural residential dwellings. The nearest residential dwellings are generally located adjacent to the project site, along the southern, western, and eastern boundaries of the site.

PROJECT IMPACTS

THRESHOLDS OF SIGNIFICANCE

Criteria for determining the significance of air quality impacts were developed based on information contained in the California Environmental Quality Act Guidelines (CEQA Guidelines, Appendix G). According to those guidelines, a project may have a significant effect on the environment if it would result in the following conditions:

1. Conflict with or obstruct implementation of any applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
3. 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors).
4. Expose sensitive receptors to substantial pollutant concentrations.
5. Create objectionable odors affecting a substantial number of people.

To assist local jurisdictions in the evaluation of air quality impacts, the MBARD has published the *CEQA Air Quality Guidelines* (MBARD 2008). This guidance document includes recommended thresholds of significance to be used for the evaluation of short-term construction, long-term operational, odor, toxic air contaminant, and cumulative air quality impacts. The following MBARD-recommended thresholds of significance were relied upon for determination of impact significance:

- **Short-term Emissions of Criteria Air Pollutants**. Construction impacts would be significant if the proposed project would emit greater than 82 pounds per day (lbs/day) of PM_{10}, or will cause a violation of PM_{10} National or State AAQS at nearby receptors. Construction-generated emissions of ozone precursors (i.e., ROG or NO_X) are accommodated in the emission inventories of State and federally-required air plans. For this reason, the MBARD has not identified recommended thresholds of significance for construction-generated ozone precursors.
- **Long-Term Emissions of Criteria Air Pollutants**. Operational impacts would be considered potentially significant if direct and indirect emissions would exceed 137 lbs/day of either ROG or NO_X, 82 lbs/day of PM_{10}, or if the project would contribute to local PM_{10} concentrations that exceed Ambient Air Quality Standards. Emissions of SO_X would be significant if the project generates direct emissions of greater than 150 lbs/day;
- **Local Mobile-Source CO Concentrations**. Local mobile-source impacts would be significant if the project generates direct emissions of greater than 550 lbs/day of CO or if the project would contribute to local CO concentrations that exceed the CAAQS of 9.0 ppm for 8 hours or 20 ppm for 1 hour. (Indirect emissions are typically considered to include mobile sources that access the project site but generally emit off-site; direct emissions typically include sources that emitted on-site (e.g., stationary sources, on-site mobile equipment).
- **Toxic Air Contaminants**. TAC impacts would be significant if the project would expose the public to substantial levels of TACs so that the probability of contracting cancer for the Maximally Exposed Individual would exceed 10 in 1 million and/or so that ground-level concentrations of non-carcinogenic toxic air contaminants would result in a Hazard Index greater than 1 for the Maximally Exposed Individual.
- **Odorous Emissions**. Odor impacts would be significant if the project has the potential to frequently expose members of the public to objectionable odors.

METHODOLOGY

Short-term Construction

Short-term emissions were quantified using the California Emissions Estimator Model (CalEEMod), version 2016.3.2. Based on the tentative parcel map filed for this project, construction of the proposed project could potentially occur in two phases. However, to ensure a conservative analysis, construction of the proposed project was assumed to occur over an estimated one-year period. Emissions modeling included an estimated 6,500 square feet of existing structures to be demolished and a total of approximately 11,100 cubic yards of soil to be imported. Modeling assumptions, including off-road equipment usage, worker and vendor vehicle trips, trips distances and fleet mix were based largely on model defaults for Monterey County. Refer to Appendix B for emissions modeling assumptions and results. Localized air quality impacts were qualitatively assessed.

Long-term Operation

Long-term emissions of were quantified using CalEEMod, version 2016.3.2 assuming a total of 19 single-family residential dwelling units. Vehicle trip-generation rates were derived from the traffic analysis prepared for this project (Keith Higgins 2017). Energy intensity factors were adjusted to reflect compliance with Renewable Portfolio Standards requirements. Proposed residential dwellings were assumed to include installation of solar photovoltaic systems, low-flow water fixtures, water-efficient irrigation systems, energy-efficient lighting and appliances, in compliance with current and anticipated construction year building code requirements. Other modeling assumptions, including energy and water usage rates, waste-generation rates, vehicle trip distances, and vehicle fleet mix were based on CalEEMod model defaults for Monterey County. As noted above, development of the proposed project could potentially occur in two phases over multiple years. However, to ensure a conservative analysis, buildout for the proposed project was assumed to occur in 2020. Emissions for post-2020 operational conditions would be less due largely to projected reductions in future-year energy usage rates and vehicle emission factors. Refer to Appendix B for emissions modeling assumptions and results. Localized air quality impacts were qualitatively assessed.

PROJECT IMPACTS

Impact AQ-1: Conflict with or obstruct implementation of any applicable air quality plan.

Consistency with the AQMP is assessed by comparing the proposed growth associated with a proposed project with the population and dwelling unit forecasts adopted by the Association of Monterey Bay Area Governments (AMBAG). These projections are used to generate emission forecasts upon which the AQMP is based. Project's which are consistent with AMBAG's regional forecasts would be considered consistent with the AQMP (MBARD 2008). In addition, projects that would result in a significant increase in emissions, in excess of MBARD significance thresholds, would also be considered to potentially conflict with or obstruct implementation of the AQMP.

The proposed project would not result in a substantial increase in employment, nor would the proposed project result in increased population growth. The proposed project would be consistent with the AQMP (AMBAG 2006). In addition, as noted in Impact 3, the proposed project would not result in a significant increase in emissions. For these reasons, implementation of the proposed project is not anticipated to result in a substantial increase in either direct or indirect emissions that would conflict with or obstruct implementation of the AQMP. This impact is considered less than significant. No mitigation is required. (Refer to Impacts AQ-3 and AQ-4 for additional discussion of air quality impacts.)

Impact AQ-2: Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

As discussed in Impacts AQ-3 and AQ-4, implementation of the proposed project would not result in short-term or long-term increases in emissions that would violate any air quality standard or contribute to an existing or projected air quality violation. As a result, this impact is considered less than significant. No mitigation is required. (Refer to Impacts AQ-3 and AQ-4 for additional discussion of air quality impacts.)

Impact AQ-3: 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Construction Emissions

Construction-generated emissions are short-term and of temporary duration, lasting only as long as construction activities occur, but possess the potential to represent a significant air quality impact. The construction of the proposed uses would result in the temporary generation of emissions resulting from site grading and excavation, asphalt paving, the application of architectural coatings, motor vehicle exhaust associated with construction equipment and on-road vehicle trips. Emissions of PM are largely associated with ground disturbance and the movement of construction vehicles and equipment on unpaved surfaces.

Construction-generated emissions associated with the proposed project are summarized in Table 4. As depicted, development of the proposed project would generate maximum daily PM_{10} emissions of approximately 63.2 lbs/day. Emissions of PM would largely occur during the site preparation and grading activities. Construction activities would not generate PM_{10} emissions that would exceed the MBARD's significance threshold of 82 lbs/day. Furthermore, compliance with existing MBARD rules and regulations, such as Rule 402 (Nuisances), Rule 426 (Architectural Coatings), and Rule 425 (Use of Cutback Asphalt) would further minimize potential short-term air quality impacts. For instance, with application of water for the control of nuisance-related dust emissions, construction-generated PM_{10} would total approximately 21.6 lbs/day. As a result, short-term construction activities would be considered to have a less-than-significant air quality impact. No mitigation is required.

Operational Emissions

Daily operational emissions associated with the proposed project are summarized in Table 5. As depicted, the proposed project would generate maximum daily emissions of approximately 14.1 lbs/day of ROG, 2.8 lbs/day of NO_X, 24.3 lbs/day of CO, 0.1 lbs/day of SO_X, 3.5 lbs/day of PM_{10}, and 2.7 lbs/day of $PM_{2.5}$. It is important to note that operational emissions were conservatively quantified based on a buildout year of 2020. Operational emissions are projected to decline in future years due primarily to improvements in vehicle efficiency and reductions in energy use-related emissions. Daily operational emissions would not exceed applicable MBARD significance thresholds. Long-term operation of the proposed project would be considered to have a less-than-significant air quality impact. No mitigation is required.

Table 4
Construction Emissions of Criteria Air Pollutants

Construction Activity	Emissions (lbs/day)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Demolition				
On-Site:	3.5	35.8	2.1	1.7
Off-Site:	0.1	0.6	0.2	0.1
Total:	3.6	36.4	2.3	1.8
Site Preparation				
On-Site:	4.3	45.6	20.5	12.1
Off-Site:	0.6	17.6	1.2	0.4
Total:	4.9	63.2	21.7	12.5
Grading				
On-Site:	2.6	28.4	8.0	4.7
Off-Site:	0.4	11.7	0.8	0.3
Total:	3.0	40.1	8.8	5.0
Building Construction				
On-Site:	2.4	21.1	1.3	1.2
Off-Site:	0.1	0.3	0.1	<0.1
Total:	2.5	21.4	1.4	1.2
Architectural Coating Application				
On-Site:	3.6	1.8	0.1	0.1
Off-Site:	<0.1	<0.1	<0.1	<0.1
Total:	3.6	1.8	0.1	0.1
Paving				
On-Site:	1.4	14.1	0.7	0.7
Off-Site:	0.1	0.1	0.1	<0.1
Total:	1.5	14.2	0.8	0.7
Maximum Daily Emissions: [1]	7.6	63.2	21.7	12.5
MBARD Significance Threshold[2]:	-	-	82	-
Exceeds Threshold/Significant Impact?	NA	NA	No	NA

1. Based on highest daily emissions during demolition, site preparation, grading, and building construction under summer or winter conditions. Assumes building construction, paving, and architectural coating application, could occur simultaneously.

2. The MBARD has not identified significance thresholds for ROG, NO_X, or $PM_{2.5}$. Emissions of ROG and NO_X are accommodated in the emission inventories of State- and federally-required air plans and would not have a significant impact on the attainment and maintenance of ozone AAQS.Emissions of $PM_{2.5}$ are a component of PM_{10}.

Refer to Appendix A for emissions modeling assumptions and results.

Table 5
Operational Emissions of Criteria Air Pollutants

Source	Emissions (lbs/day) [1]					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Area Sources	13.6	0.4	18.0	<0.1	2.3	2.3
Energy Use	<0.1	0.1	0.1	<0.1	<0.1	<0.1
Mobile Sources	0.5	2.2	6.2	<0.1	1.2	0.3
Maximum Daily Emissions [5]:	14.1	2.8	24.3	0.1	3.5	2.7
MBARD Significance Threshold:	137	137	550	150	82	-
Exceeds Threshold/Significant Impact?	No	No	No	No	No	NA

1. To be conservative, maximum daily emissions are based on the highest daily emissions for summer or winter conditions.

Refer to Appendix A for emissions modeling assumptions and results.

Impact AQ-4: Expose sensitive receptors to substantial pollutant concentrations.

Short-term Exposure

Naturally-Occurring Asbestos

Naturally-occurring asbestos, which was identified by ARB as a TAC in 1986, is located in many parts of California and is commonly associated with ultramafic rock. The project site is not located near any areas that are likely to contain ultramafic rock (DOC 2000). As a result, risk of exposure to asbestos during the construction process would be considered less than significant. No mitigation is required.

DPM Emissions

Implementation of the proposed project would result in the generation of DPM emissions during construction associated with the use of off-road diesel equipment for site grading and excavation, paving and other construction activities. Health-related risks associated with diesel-exhaust emissions are primarily associated with long-term exposure and associated risk of contracting cancer. For residential land uses, the calculation of cancer risk associated with exposure of to TACs are typically calculated based on a 25 to 30-year period of exposure. The use of diesel-powered construction equipment, however, would be temporary and episodic and would occur over a relatively large area. Assuming that construction activities involving the use of diesel-fueled equipment would to occur over an approximate 12-month period, project-related construction activities would constitute less than four percent of the typical exposure period. As a result, exposure to construction-generated DPM would not be anticipated to exceed applicable thresholds (i.e., incremental increase in cancer risk of 10 in one million). This impact would be considered less than significant. No mitigation is required.

Fugitive Dust Emissions

Implementation of the proposed project would result in short-term emissions of fugitive PM associated with ground disturbance and demolition of onsite structures. In addition, the demolition of onsite structures may also result in the disturbance of asbestos-containing materials. However, compliance with applicable MBARD rules and regulations, including but not limited to, Rule 402 for the control of nuisance–related emissions and Rule 424 for the handling of asbestos-containing building materials would minimize potential impacts to occupants of nearby land uses. In addition, as noted in Impact AQ-3, construction-generated PM_{10} would not exceed MBARD's daily significance threshold of 82 lbs/day. For these reasons, construction activities would be considered to have a less-than-significant short-term impact to nearby sensitive receptors. No mitigation is required.

Long-term Exposure

Implementation of the proposed project would not result in the installation of any major stationary sources of emissions. As a result, CO generated by mobile sources would be considered the primary pollutant of local concern. Mobile-source emissions of CO are a direct function of traffic volume, speed, and delay. Transport of CO is extremely limited because it disperses rapidly with distance from the source under normal meteorological conditions. However, under specific meteorological and operational conditions, such as near areas of heavily congested vehicle traffic, CO concentrations may reach unhealthy levels. If inhaled, CO can be adsorbed easily by the blood stream and can inhibit oxygen delivery to the body, which can cause significant health effects ranging from slight headaches to death. The most serious effects are felt by individuals susceptible to oxygen deficiencies, including people with anemia and those suffering from chronic lung or heart disease. For this reason, localized mobile-source CO concentrations are of potential concern near signalized intersections that experience high traffic volumes/vehicle congestion and are projected to operate at unacceptable levels of service (i.e., LOS E, or worse) (Caltrans 1996).

Based on the traffic analysis prepared for the proposed project, the primarily affected signalized intersection in the project area would include the Prundale South Road/Blackie Road intersection. The Prundale South Road/Blackie Road intersection is projected to operate at LOS B, or better, during the peak commute hours (Keith Higgins 2017). In comparison to the CO screening criteria, implementation of the proposed project would not result in or contribute to unacceptable levels of service (i.e., LOS E, or worse) at primarily affected signalized intersections. For this reason and given the regions low background CO concentrations, implementation of the proposed project would not result in or contribute to localized mobile-source CO concentrations that would be projected to exceed applicable ambient air quality standards. This impact would be considered less than significant. No mitigation is required.

Impact AQ-5: Create objectionable odors affecting a substantial number of people.

Implementation of the proposed project would not result in the installation of any major sources of odors. In addition, no major sources of odors have been identified in the vicinity of the project site. As a result, implementation of the proposed project would not result in the long-term exposure of individuals to increased concentrations of odors. However, construction of the proposed facilities would involve the use of a variety of gasoline or diesel-powered equipment that would emit exhaust fumes. Exhaust fumes, particularly diesel-exhaust, may be considered objectionable by some people. In addition pavement coatings and architectural coatings used during project construction would also emit temporary odors. However, construction-generated emissions would occur intermittently and would dissipate rapidly within increasing distance from the source. As a result, short-term construction activities would not expose a substantial number of people to frequent odorous emissions. For these reasons, this impact would be considered less than significant. No mitigation is required.

GREENHOUSE GASES AND CLIMATE CHANGE

EXISTING SETTING

To fully understand global climate change, it is important to recognize the naturally occurring "greenhouse effect" and to define the GHGs that contribute to this phenomenon. 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 the 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. Greenhouse gases, 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, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Primary GHGs attributed to global climate change, are discussed, as follows:

- **Carbon Dioxide**. Carbon dioxide (CO_2) is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere (U.S. EPA 2018c).

- **Methane**. Methane (CH_4) is a colorless, odorless gas that is not flammable under most circumstances. CH_4 is the major component of natural gas, about 87percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years (U.S. EPA 2018c).

- **Nitrous Oxide**. Nitrous oxide (N_2O) is a clear, colorless gas with a slightly sweet odor. N_2O is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years (U.S. EPA 2018c).

- **Hydrofluorocarbons.** Hydrofluorocarbons (HFCs) are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HCFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 270 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes of less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, has an atmospheric life of 14 years) (U.S. EPA 2018c).

- **Perfluorocarbons.** Perfluorocarbons (PFCs) are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane (CF_4), perfluoroethane (C_2F_6), perfluoropropane (C_3F_8), perfluorobutane (C_4F_{10}), perfluorocyclobutane (C_4F_8), perfluoropentane (C_5F_{12}), and perfluorohexane (C_6F_{14}). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which

releases CF_4 and C_2F_6 as byproducts. The estimated atmospheric lifetimes for PFCs ranges from 2,600 to 50,000 years (U.S. EPA 2018c).

- **Nitrogen Trifluoride**. Nitrogen trifluoride (NF_3) is an inorganic, colorless, odorless, toxic, nonflammable gas used as an etchant in microelectronics. Nitrogen trifluoride is predominantly employed in the cleaning of the plasma-enhanced chemical vapor deposition chambers in the production of liquid crystal displays and silicon-based thin film solar cells. It has a global warming potential of 16,100 carbon dioxide equivalents (CO_2e). While NF_3 may have a lower global warming potential than other chemical etchants, it is still a potent GHG. In 2009, NF_3 was listed by California as a high global warming potential GHG to be listed and regulated under Assembly Bill (AB) 32 (Section 38505 Health and Safety Code).

- **Sulfur Hexafluoride**. Sulfur hexafluoride (SF_6) is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF_6 is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF_6 produced worldwide. Leaks of SF_6 occur from aging equipment and during equipment maintenance and servicing. SF_6 has an atmospheric life of 3,200 years (U.S. EPA 2018c).

- **Black Carbon**. Black carbon is the strongest light-absorbing component of particulate matter (PM) emitted from burning fuels such as coal, diesel, and biomass. Black carbon contributes to climate change both directly by absorbing sunlight and indirectly by depositing on snow and by interacting with clouds and affecting cloud formation. Black carbon is considered a short-lived species, which can vary spatially and, consequently, it is very difficult to quantify associated global-warming potentials. The main sources of black carbon in California are wildfires, off-road vehicles (locomotives, marine vessels, tractors, excavators, dozers, etc.), on-road vehicles (cars, trucks, and buses), fireplaces, agricultural waste burning, and prescribed burning (planned burns of forest or wildlands) (CCAC 2018, U.S. EPA 2018c).

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Often, estimates of GHG emissions are presented in CO_2e, which weight each gas by its global warming potential (GWP). Expressing GHG emissions in CO_2e 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. Table 6 provides a summary of the GWP for GHG emissions of typical concern with regard to community development projects, based on a 100-year time horizon. As indicated, Methane traps over 25 times more heat per molecule than CO_2, and N_2O absorbs roughly 298 times more heat per molecule than CO_2. Additional GHG with high GWP include Nitrogen trifluoride, Sulfur hexafluoride, Perfluorocarbons, and black carbon.

Table 6
Global Warming Potential for GHGs

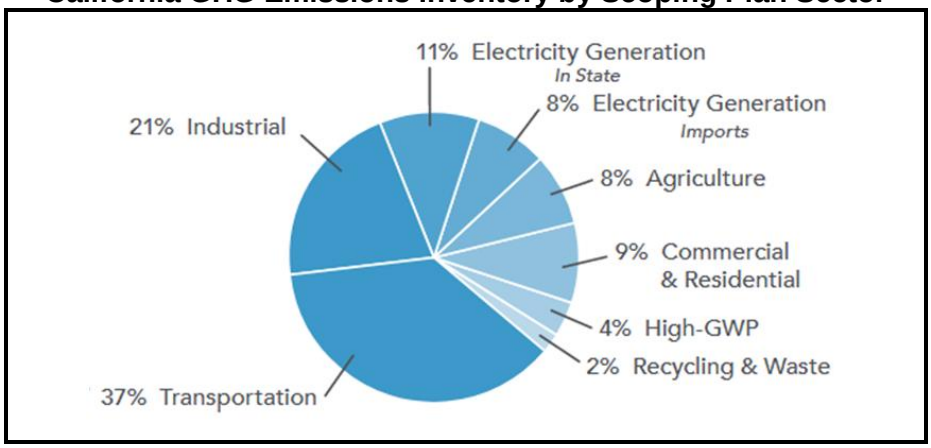
Greenhouse Gas	Global Warming Potential (100-year)
Carbon Dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous Dioxide (N_2O)	298
**Based on IPCC GWP values for 100-year time horizon* *Source: IPCC 2007*	

SOURCES OF GHG EMISSIONS

On a global scale, GHG emissions are predominantly associated with activities related to energy production; changes in land use, such as deforestation and land clearing; industrial sources; agricultural activities; transportation; waste and wastewater generation; and commercial and residential land uses. World-wide, energy production including the burning of coal, natural gas, and oil for electricity and heat is the largest single source of global GHG emissions (U.S. EPA 2018c).

In 2015, GHG emissions within California totaled 440.4 million metric tons (MMT) of CO_2e. GHG emissions, by sector, are summarized in Figure 3. Within California, the transportation sector is the largest contributor, accounting for approximately 37 percent of the total state-wide GHG emissions. Emissions associated with industrial uses are the second largest contributor, totaling roughly 21 percent. Electricity generation totaled roughly 19 percent (ARB 2018d).

Figure 3
California GHG Emissions Inventory by Scoping Plan Sector



Source: ARB 2018d

Short-Lived Climate Pollutants

Short-lived climate pollutants (SLCPs), such as black carbon, fluorinated gases, and methane also have a dramatic effect on climate change. Though short lived, these pollutants create a warming influence on the climate that is many times more potent than that of carbon dioxide.

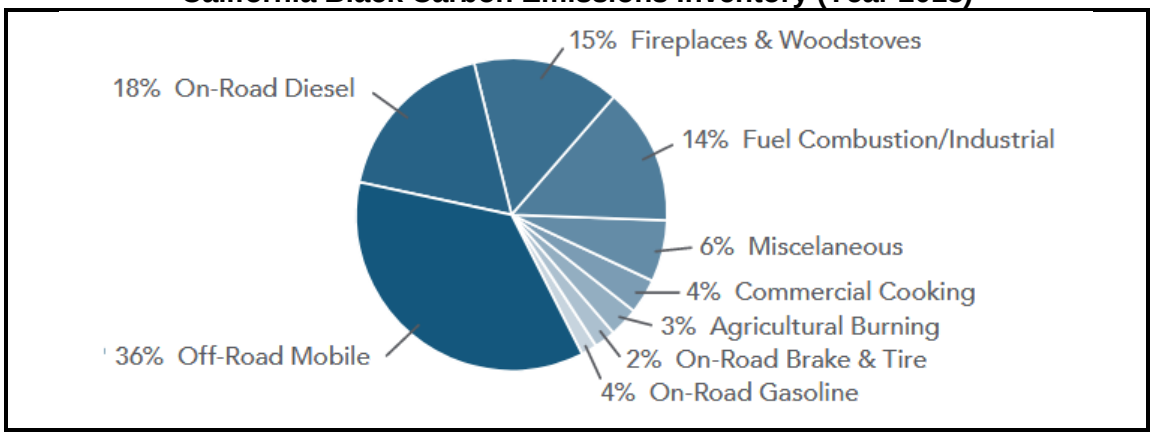
As part of the ARB's efforts to address SLCPs, the ARB has developed a statewide emission inventory for black carbon. The black carbon inventory will help support implementation of the SLCP Strategy, but it is not part of the State's GHG Inventory that tracks progress towards the State's climate targets. The most recent inventory for year 2013 conditions is depicted in Figure 4. As depicted, off-road mobile sources account for a majority of black carbon emissions totaling roughly 36 percent of the inventory. Other major anthropogenic sources of black carbon include on-road transportation, residential wood burning, fuel combustion, and industrial processes (ARB 2018e).

EFFECTS OF GLOBAL CLIMATE CHANGE

There are uncertainties as to exactly what the climate changes will be in various local areas of the earth. There are also uncertainties associated with the magnitude and timing of other consequences of a warmer planet: sea level rise, spread of certain diseases out of their usual geographic range, the effect on agricultural production, water supply, sustainability of ecosystems, increased strength and frequency of storms, extreme heat events, increased air pollution episodes, and the consequence of these effects on the economy.

Within California, climate changes would likely alter the ecological characteristics of many ecosystems throughout the state. Such alterations would likely include increases in surface temperatures and changes in the form, timing, and intensity of precipitation. For instance, historical records are depicting an increasing trend toward earlier snowmelt in the Sierra Nevada. This snow pack is a principal supply of water for the state, providing roughly 50 percent of state's annual runoff. If this trend continues, some areas of the state may experience an increased danger of floods during the winter months and possible exhaustion of the

Figure 4
California Black Carbon Emissions Inventory (Year 2013)



Source: ARB 2018d

snowpack during spring and summer months. An earlier snowmelt would also impact the State's energy resources. Currently, approximately 20 percent of California's electricity comes from hydropower. An early exhaustion of the Sierra snowpack, may force electricity producers to switch to more costly or non-renewable forms of electricity generation during spring and summer months. A changing climate may also impact agricultural crop yields, coastal structures, and biodiversity. As a result, resultant changes in climate will likely have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry (CCCC 2012; PCL 2018).

REGULATORY FRAMEWORK

FEDERAL

Executive Order 13514

Executive Order 13514 is focused on reducing GHGs internally in federal agency missions, programs, and operations. In addition, the executive order directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

On April 2, 2007, in Massachusetts v. U.S. EPA, 549 U.S. 497 (2007), the Supreme Court found that GHGs are air pollutants covered by the FCAA and that the U.S. EPA has the authority to regulate GHG. The Court held that the U.S. EPA Administrator must determine whether or not 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.

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator found that the current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator found 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.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the U.S. EPA's "Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles", which was published on September 15, 2009. On May 7, 2010 the final "Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards" was published in the Federal Register.

U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations. These steps were outlined by President Obama in a Presidential Memorandum on May 21, 2010.

The final combined U.S. EPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile (the equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements). Together, these standards will cut GHG emissions by an estimated 960 MMT and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016). On August 28, 2012, U.S. EPA and NHTSA issued their joint rule to extend this national program of coordinated GHG and fuel economy standards to model years 2017 through 2025 passenger vehicles.

STATE

Assembly Bill 1493

AB 1493 (Pavley) of 2002 (Health and Safety Code Sections 42823 and 43018.5) requires the ARB to develop and adopt the nation's first GHG emission standards for automobiles. These standards are also known as Pavley I. The California Legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. It cites several risks that California faces from climate change, including a reduction in the state's water supply; an increase in air pollution caused by higher temperatures; harm to agriculture; an increase in wildfires; damage to the coastline; and economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce GHG emissions would stimulate California's economy and provide jobs. In 2004, the State of California submitted a request for a waiver from federal clean air regulations, as the State is authorized to do under the FCAA, to allow the State to require reduced tailpipe emissions of CO_2. In late 2007, the U.S. EPA denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the State brought suit against the U.S. EPA related to this denial.

In January 2009, President Obama instructed the U.S. EPA to reconsider the Bush Administration's denial of California's and 13 other states' requests to implement global warming pollution standards for cars and trucks. In June 2009, the U.S. EPA granted California's waiver request, enabling the State to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

In 2009, President Obama announced a national policy aimed at both increasing fuel economy and reducing GHG pollution for all new cars and trucks sold in the US. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon by 2016. When the national program takes effect, California has committed to allowing automakers who show compliance with the national program to also be deemed in compliance with state requirements. California is committed to further strengthening these standards beginning in 2017 to obtain a 45 percent GHG reduction from the 2020 model year vehicles.

Executive Order No. S-3-05

Executive Order S-3-05 (State of California) proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the

Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the secretary of CalEPA created a Climate Action Team made up of members from various state agencies and commissions. The Climate Action Team released its first report in March 2006 and continues to release periodic reports on progress. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32 - California Global Warming Solutions Act of 2006

AB 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599) requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include CO_2, CH_4, N_2O, HFCs, PFCs, NF_3, and SF_6. The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions that were phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions (ARB 2018c).

Climate Change Scoping Plan

In October 2008, ARB published its *Climate Change Proposed Scoping Plan*, which is the State's plan to achieve GHG reductions in California required by AB 32. This initial Scoping Plan contained the main strategies to be implemented in order to achieve the target emission levels identified in AB 32. The Scoping Plan included ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations were associated with improving emissions standards for light-duty vehicles, implementing the Low Carbon Fuel Standard program, implementation of energy efficiency measures in buildings and appliances, and the widespread development of combined heat and power systems, and developing a renewable portfolio standard for electricity production.

The Scoping Plan states that land use planning and urban growth decisions will play important roles in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. ARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emissions sectors. With regard to land use planning, the Scoping Plan expects approximately 5.0 MMT CO_2e will be achieved associated with implementation of Senate Bill 375, which is discussed further below.

The initial Scoping Plan was first approved by ARB on December 11, 2008 and is updated every five years. The first update of the Scoping Plan was approved by the ARB on May 22, 2014, which looked past 2020 to set mid-term goals (2030-2035) on the road to reaching the 2050 goals., The most recent update released by ARB is the *2017 Climate Change Scoping Plan*, which was released In November 2017. The *2017 Climate*

Change Scoping Plan incorporates strategies for achieving the 2030 GHG-reduction target established in SB 32 and EO B-30-15.

Senate Bill 1078 and Governor's Order S-14-08 (California Renewables Portfolio Standards)

Senate Bill 1078 (Public Utilities Code Sections 387, 390.1, 399.25 and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20 percent of their supply from renewable sources by 2017. This Senate Bill will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which set the Renewables Portfolio Standard target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target. Executive Order S-14-08 was later superseded by Executive Order S-21-09 on September 15, 2009. Executive Order S-21-09 directed the ARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. Statute SB X1-2 superceded this Executive Order in 2011, which obligated all California electricity providers, including investor-owned utilities and publicly owned utilities, to obtain at least 33 percent of their energy from renewable electrical generation facilities by 2020.

ARB is required by current law, AB 32 of 2006, to regulate sources of GHGs to meet a state goal of reducing GHG emissions to 1990 levels by 2020 and an 80 percent reduction of 1990 levels by 2050. The California Energy Commissions and California Public Utilities Commission serve in advisory roles to help ARB develop the regulations to administer the 33 percent by 2020 requirement. ARB is also authorized to increase the target and accelerate and expand the time frame.

Mandatory Reporting of GHG Emissions

The California Global Warming Solutions Act (AB 32, 2006) requires the reporting of GHGs by major sources to the ARB. Major sources required to report GHG emissions include industrial facilities, suppliers of transportation fuels, natural gas, natural gas liquids, liquefied petroleum gas, and carbon dioxide, operators of petroleum and natural gas systems, and electricity retail providers and marketers.

Cap-and-Trade Regulation

The cap-and-trade regulation is a key element in California's climate plan. It sets a statewide limit on sources responsible for 85 percent of California's GHG emissions and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The cap-and-trade rules came into effect on January 1, 2013, and apply to large electric power plants and large industrial plants. In 2015, fuel distributors, including distributors of heating and transportation fuels, also became subject to the cap-and-trade rules. At that stage, the program will encompass around 360 businesses throughout California and nearly 85 percent of the state's total GHG emissions.

Under the cap-and-trade regulation, companies must hold enough emission allowances to cover their emissions and are free to buy and sell allowances on the open market. California held its first auction of GHG allowances on November 14, 2012. California's GHG cap-and-trade system is projected to reduce GHG emissions to 1990 levels by the year 2020 and would achieve an approximate 80 percent reduction from 1990 levels by 2050.

Senate Bill 32

SB 32 was signed by Governor Brown on September 8, 2016. SB 32 effectively extends California's GHG emission-reduction goals from year 2020 to year 2030. This new emission-reduction target of 40 percent below 1990 levels by 2030 is intended to promote further GHG-reductions in support of the State's ultimate goal of reducing GHG emissions by 80 percent below 1990 levels by 2050. SB 32 also directs the ARB to update the Climate Change Scoping Plan to address this interim 2030 emission-reduction target.

Senate Bill 375

SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will address land use allocation in that MPOs regional transportation plan. ARB, in consultation with MPOs, establishes regional reduction targets for GHGs emitted by passenger cars and light trucks for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, funding for transportation projects may be withheld.

California Building Code

The CBC contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The California Building Code is adopted every three years by the BSC. In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBC standards apply statewide; however, a local jurisdiction may amend a CBC standard if it makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

Green Building Standards

In essence, green buildings standards are indistinguishable from any other building standards. Both standards are contained in the CBC and regulate the construction of new buildings and improvements. The only practical distinction between the two is that whereas the focus of traditional building standards has been protecting public health and safety, the focus of green building standards is to improve environmental performance.

AB 32, which mandates the reduction of GHG emissions in California to 1990 levels by 2020, increased the urgency around the adoption of green building standards. In its scoping plan for the implementation of AB 32, ARB identified energy use as the second largest contributor to California's GHG emissions, constituting roughly 25 percent of all such emissions. In recommending a green building strategy as one element of the scoping plan, ARB estimated that green building standards would reduce GHG emissions by approximately 26 MMT of CO_2e by 2020. Most recently, the California Energy Commission adopted new building energy efficiency standards that amends the building code to require improvements in building insulation, use of energy-efficient lighting, and the incorporation of rewable energy technology (e.g., solar photovoltaic systems) for newly constructed residential dwellings. These standards are anticipated to reduce energy usage by approximately 50 percent for residential buildings and 30 percent for nonresidential buildings (CEC 2018).

Senate Bill 97

Senate Bill 97 (SB 97) was enacted in 2007. SB 97 required OPR to develop, and the Natural Resources Agency to adopt, amendments to the CEQA Guidelines addressing the analysis and mitigation of GHG emissions. Those CEQA Guidelines amendments clarified several points, including the following:

- Lead agencies must analyze the GHG emissions of proposed projects and must reach a conclusion regarding the significance of those emissions.
- When a project's GHG emissions may be significant, lead agencies must consider a range of potential mitigation measures to reduce those emissions.
- Lead agencies must analyze potentially significant impacts associated with placing projects in hazardous locations, including locations potentially affected by climate change.
- Lead agencies may significantly streamline the analysis of GHGs on a project level by using a programmatic GHG emissions reduction plan meeting certain criteria.
- CEQA mandates analysis of a proposed project's potential energy use (including transportation-related energy), sources of energy supply and ways to reduce energy demand, including through the use of efficient transportation alternatives.

As part of the administrative rulemaking process, the California Natural Resources Agency developed a Final Statement of Reasons explaining the legal and factual bases, intent, and purpose of the CEQA Guidelines amendments. The amendments to the CEQA Guidelines implementing SB 97 became effective on March 18, 2010.

Short-Lived Climate Pollutant Reduction Strategy

In March 2017, the ARB adopted the "Short-Lived Climate Pollutant Reduction Strategy" (*SLCP Strategy*) establishing a path to decrease GHG emissions and displace fossil-based natural gas use. Strategies include avoiding landfill methane emissions by reducing the disposal of organics through edible food recovery, composting, in-vessel digestion, and other processes; and recovering methane from wastewater treatment facilities, and manure methane at dairies, and using the methane as a renewable source of natural gas to fuel vehicles or generate electricity. The *SLCP Strategy* also identifies steps to reduce natural gas leaks from oil and gas wells, pipelines, valves, and pumps to improve safety, avoid energy losses, and reduce methane emissions associated with natural gas use. Lastly, the *SLCP Strategy* also identifies measures that can reduce hydrofluorocarbon (HFC) emissions at national and international levels, in addition to State-level action that includes an incentive program to encourage the use of low-Global Warming Potential (GWP) refrigerants, and limitations on the use of high-GWP refrigerants in new refrigeration and air-conditioning equipment (ARB 2017).

PROJECT IMPACTS

THRESHOLDS OF SIGNIFICANCE

In accordance with CEQA Guidelines, a project would be considered to have a significant impact to climate change if it would:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or,

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

As of June 2018, the MBARD Board of Directors has not adopted recommended GHG significance thresholds applicable to development projects (MBARD 2014). However, it is important to note that other air districts within the State of California have recently adopted recommended CEQA significance thresholds for GHG emissions. For instance, on March 28, 2012 the San Luis Obispo Air Pollution Control District (SLOAPCD) Board approved thresholds of significance for the evaluation of project-related increases of GHG emissions. The SLOAPCD's significance thresholds include both qualitative and quantitative threshold options, which include a bright-line threshold of 1,150 $MTCO_2e$/year. The Sacramento Metropolitan Air Quality Management District (SMAQMD) the Mendocino County Air Quality Management District (MCAQMD) have adopted similar significance thresholds of 1,100 $MTCO_2e$/year and the Placer County Air Pollution Control District is currently considering adoption of a proposed mass-emissions threshold of 1,100 $MTCO_2e$/year. The GHG significance thresholds are based on AB 32 GHG emission reduction goals, which take into consideration the emission reduction strategies outlined in ARB's Scoping Plan. Development projects located within these jurisdictions that would exceed these thresholds would be considered to have a potentially significant impact on the environment which could conflict with applicable GHG-reduction plans, policies and regulations. Projects with GHG emissions that do not exceed the applicable threshold would be considered to have a less-than-significant impact on the environment and would not be anticipated to conflict with AB 32 GHG emission-reduction goals (PCAPCD 2016; SLOAPCD 2016; SMAQMD 2014, MCAQMD 2010).

As noted above, MBARD has not yet adopted recommended GHG significance thresholds applicable to development projects.In the interim, the MBARD recommends use of other thresholds, such as those adopted by the SLOAPCD. For purposes of this analysis, project-generated emissions in excess of 1,100 $MTCO_2e$/year would be considered to have a potentially significant impact. This mass-emission threshold is based on thresholds adopted by SMAQMD and MCAQMD, which is slightly more conservative than the threshold recommended by SLOAPCD.

METHODOLOGY

Short-term Construction

Short-term emissions were quantified using CalEEMod, version 2016.3.2. Based on the tentative parcel map filed for this project, construction of the proposed dwelling units could potentially occur in two phases. However, to ensure a conservative analysis, construction of the proposed project was assumed to occur over an estimated one-year period. Emissions modeling included an estimated 6,500 square feet of existing structures to be demolished and a total of approximately 11,100 cubic yards of soil to be imported. Modeling assumptions, including off-road equipment usage, worker and vendor vehicle trips, trips distances and fleet mix were based largely on model defaults for Monterey County. Construction-generated GHGs were amortized over an estimated 30-year project life and included with operational emissions for determination of impact significance. Refer to Appendix B for emissions modeling assumptions and results. Localized air quality impacts were qualitatively assessed.

Long-term Operation

Long-term emissions of were quantified using CalEEMod, version 2016.3.2 assuming a total of 19 single-family residential dwelling units. Vehicle trip-generation rates were derived from the traffic analysis prepared for this project (Keith Higgins 2017). Energy intensity factors were adjusted to reflect compliance with Renewable Portfolio Standards requirements. Proposed residential dwellings were assumed to include installation of solar photovoltaic systems, low-flow water fixtures, water-efficient irrigation systems, energy-efficient lighting and appliances, in compliance with current and anticipated construction year building code requirements. Solar PV systems were assumed to provide a minimum of 20 percent of the estimated electrical demand. Other modeling assumptions, including energy and water usage rates, waste-generation rates, vehicle trip distances, and vehicle fleet mix were based on CalEEMod model defaults for Monterey County. As noted above, development of the proposed project could potentially occur in two phases over multiple years. However, to ensure a conservative analysis, buildout for the proposed project was assumed to occur in 2020. Emissions for post-2020 operational conditions would be less due largely to projected reductions in future-year energy usage rates and vehicle emission factors. Operational GHG emissions were quantified for years 2020 and 2030 to coincide with the state's GHG-reduction target years. Refer to Appendix B for emissions modeling assumptions and results. Localized air quality impacts were qualitatively assessed.

PROJECT IMPACTS

Impact GHG-1: Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? and

Would the project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

Short-term Construction

Construction-generated GHG emissions are summarized in Table 7. As depicted, construction of the proposed project would generate a total of approximately 454.8 $MTCO_2e$. Amortized GHG emissions, when averaged over an assumed 30-year life of the project, would total approximately 15.2 $MTCO_2e$/year. There would also be a small amount of GHG emissions from waste generated during construction; however, this amount is speculative. Construction-generated emissions would vary, depending on the final construction schedules, equipment required, and activities conducted. Construction-generated emissions were included with operational emissions for determination of impact significance.

Long-term Operation

Operational GHG emissions for buidout years 2020 and 2030 are summarized in Table 8. With the inclusion of amortized construction-generated emissions, buildout of the proposed project would generate a total of approximately 339 $MTCO_2e$/year under year 2020 conditions and approximately 331.9$MTCO_2e$/year under

Table 7
Construction Emissions of GHGs

Construction Activity	Annual Emissions ($MTCO_2e$/Year)
Demolition	37.3
Site Preparation	38.9
Grading	56.1
Building Construction	284.1
Architectural Coating	17.1
Paving	21.3
Total Construction Emissions:	454.8
Amortized Net Change in Construction Emissions[1]:	15.2

1. Amortized emissions are quantified based on an estimated 30-year project life.
Refer to Appendix A for emissions modeling assumptions and results.

Table 8
Operational Emissions of GHGs

Source	Annual Emissions ($MTCO_2e$/year)[1]	Percent Contribution
Year 2020		
Area	19.5	6.0 %
Energy Use	55.7	17.2 %
Mobile	239.5	74.0%
Waste	6.0	1.9 %
Water	3.1	1.0 %
Total:	323.8	
Total with Amortized Construction Emissions:[2]	339.0	
Significance Threshold:	1,100	
Exceeds Significance Threshold?:	No	
Year 2030		
Area	19.5	6.2 %
Energy Use	49.0	15.5 %
Mobile	239.5	75.6 %
Waste	6.0	1.9 %
Water	2.7	0.9 %
Total:	316.7	
Total with Amortized Construction Emissions:[2]	331.9	
Significance Threshold:	1,100	
Exceeds Significance Threshold?:	No	

1. GHG emissions quantified for buildout conditions.
2. Refer to Table 7 for amortized construction emissions..
Refer to Appendix A for emissions modeling assumptions and results.

year 2030 conditions. At buildout, mobile sources are projected to account for roughly 74-76% of the total operational GHG emissions. Approximately 16-17% of the project's total operational GHGs would be associated with energy use. The remaining emissions would be associated with area sources, water use, and waste generation. Project-generated GHG emissions are projected to decrease in future years due largely to improvements in energy-efficiency and vehicle fleet emissions.

As noted in Table 8, annual GHG emissions would not exceed the significance threshold of 1,100 $MTCO_2e$/year. As a result, the proposed project would not result in GHG emissions that would have a significant impact on the environment, nor would the proposed project conflict with applicable GHG-reduction plans, policies or regulations. This impact would be considered less than significant. No mitigation is required.

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APPENDIX A

Emissions Modeling & Supportive Documentation

AMBAG
ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS

RECEIVED
DEC 2
Denise Duffy & Associates

December 19, 2006

Alison Imamura, AICP
Denise Duffy & Associates, Inc.
947 Cass Street, Suite 5
Monterey, CA 93940

Dear Ms. Imamura:

This letter is in response to your December 1, 2006 request for a determination of consistency of the LaTourette Subdivision Project with the *Air Quality Management Plan for the Monterey Bay Region* (AQMP).

Consistency of housing projects with the AQMP is analyzed by comparing the total potential population growth facilitated by the project with the forecasted growth for Monterey County. The *2004 Population, Housing Unit, and Employment Forecasts* adopted by the AMBAG Board of Directors on April 14, 2004 are the forecasts used for this consistency determination.

AMBAG staff surveyed each jurisdiction in Monterey County to determine the number of housing units that jurisdictions have approved but have not yet received a building permit. The total number of units is 8,395. Building permit data was also collected. A total of 624 housing units have received building permits between January and November 2006. The California Department of Finance estimates there are 138,617 dwelling units in Monterey County as of 1/01/06. Combined, there are 147,636 existing, approved, and or permitted housing units in Monterey County.

The LaTourette Subdivision Project consists of a total of 19 residential units. Occupancy of the housing units is estimated to take place by 2010. The *2004 Population, Housing Unit, and Employment Forecast* forecasts there will be 151,844 housing units in Monterey County by the year 2010.

The combination of the existing and approved housing units in Monterey County (147,655) plus the 19 housing units in the LaTourette Subdivision Project is less then the regional forecasts for Monterey County (151,844.) Therefore the LaTourette Subdivision Project is **consistent** with the 2004 regional forecasts and the Air Quality Management Plan.

Please feel free to contact me if you have any questions about this determination.

Sincerely,

Todd Muck

Todd Muck, AICP
Senior Planner

cc: Jean Getchell, MBUAPCD

La Tourette Subdivision - Yr 2020

Monterey County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	19.00	Dwelling Unit	46.37	34,200.00	54

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.6	**Precipitation Freq (Days)**	55
Climate Zone	4			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	488.3	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

La Tourette Subdivision - Yr 2020 - Monterey County, Summer

Project Characteristics - Includes RPS adjustment

Land Use - 19 SFR, 46.37 ac., 34,200 sf.

Construction Phase - Based on model defaults. 20 days demo, 10 days site prep, 20 days grading, 230 days construction, 20 days paving. Arch coating distributed over building phase excluding initial 5-month development period.

Off-road Equipment - Offroad equipment based on model defaults

Trips and VMT - Based on model defaults

Demolition - Demo of 6,500 sf building area per aerial photo interpretation

Grading - Assumes 5,400 cy import plus an additional 300 cy/lot (5700); 11,100 cy total

Architectural Coating - Arch coating based on model defaults

Vehicle Trips - Weekday trip gen based on traffic analysis 9.52/DU, consistent with model default. Weekend trips and trip distances based on model defaults.

Woodstoves - Area source emissions based on model defaults

Energy Use - Energy use based on model defaults, includes RPS adjustments

Water And Wastewater - Water and wastewater based on model defaults.

Solid Waste - Solid waste based on model defaults

Energy Mitigation - Energy mitigation includes installation of solar PV providing minimum 20% electricity demand and energy-efficient lighting and appliances

Water Mitigation - Water mitigation includes installation of low-flow water fixtures and water-efficient irrigation systems.

Waste Mitigation - Solid waste assumes 50% diversion per current statewide avg.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	55.00	130.00
tblConstructionPhase	NumDays	740.00	230.00
tblConstructionPhase	NumDays	50.00	20.00
tblConstructionPhase	NumDays	75.00	20.00
tblConstructionPhase	NumDays	55.00	20.00
tblConstructionPhase	NumDays	30.00	10.00
tblGrading	MaterialImported	0.00	5,700.00
tblGrading	MaterialImported	0.00	5,400.00
tblLandUse	LotAcreage	6.17	46.37

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	641.35	488.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	713.00	712.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblVehicleTrips	HO_TL	7.90	7.50
tblVehicleTrips	HS_TL	7.10	7.30
tblVehicleTrips	HW_TL	16.80	10.80

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	5.9697	62.7157	26.2833	0.0837	19.1455	2.4784	21.6239	10.2250	2.2833	12.5083						8,631.3508
2020	5.6984	21.1432	19.0512	0.0312	0.1232	1.2299	1.3092	0.0327	1.1631	1.1844						2,982.0383
Maximum	**5.9697**	**62.7157**	**26.2833**	**0.0837**	**19.1455**	**2.4784**	**21.6239**	**10.2250**	**2.2833**	**12.5083**						**8,631.3508**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	5.9697	62.7157	26.2833	0.0837	19.1455	2.4784	21.6239	10.2250	2.2833	12.5083						8,631.3508
2020	5.6984	21.1432	19.0512	0.0312	0.1232	1.2299	1.3092	0.0327	1.1631	1.1844						2,982.0383
Maximum	**5.9697**	**62.7157**	**26.2833**	**0.0837**	**19.1455**	**2.4784**	**21.6239**	**10.2250**	**2.2833**	**12.5083**						**8,631.3508**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	13.6155	0.4009	17.9968	0.0317		2.3324	2.3324		2.3324	2.3324						518.3680
Energy	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551
Mobile	0.5231	2.0413	6.0313	0.0158	1.1550	0.0175	1.1725	0.3094	0.0164	0.3259						1,595.9878
Total	**14.1549**	**2.5817**	**24.0874**	**0.0484**	**1.1550**	**2.3611**	**3.5161**	**0.3094**	**2.3601**	**2.6695**						**2,293.4109**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	13.6155	0.4009	17.9968	0.0317		2.3324	2.3324		2.3324	2.3324						518.3680
Energy	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551
Mobile	0.5231	2.0413	6.0313	0.0158	1.1550	0.0175	1.1725	0.3094	0.0164	0.3259						1,595.9878
Total	**14.1549**	**2.5817**	**24.0874**	**0.0484**	**1.1550**	**2.3611**	**3.5161**	**0.3094**	**2.3601**	**2.6695**						**2,293.4109**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/29/2019	2/11/2019	5	10	
3	Grading	Grading	2/12/2019	3/11/2019	5	20	
4	Building Construction	Building Construction	3/12/2019	1/27/2020	5	230	
5	Architectural Coating	Architectural Coating	7/30/2019	1/27/2020	5	130	
6	Paving	Paving	1/28/2020	2/24/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 69,255; Residential Outdoor: 23,085; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating - sqft)

OffRoad Equipment

La Tourette Subdivision - Yr 2020 - Monterey County, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	30.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	534.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	712.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	7.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3347	0.0000	0.3347	0.0507	0.0000	0.0507						0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697						3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**0.3347**	**1.7949**	**2.1296**	**0.0507**	**1.6697**	**1.7204**						**3,843.4451**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0145	0.4795	0.0967	1.2400e-003	0.0262	2.4400e-003	0.0286	7.1700e-003	2.3300e-003	9.5000e-003						131.2003
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0604	0.6480	1.3800e-003	0.1232	1.1100e-003	0.1243	0.0327	1.0200e-003	0.0337						136.9811
Total	**0.0876**	**0.5399**	**0.7447**	**2.6200e-003**	**0.1494**	**3.5500e-003**	**0.1529**	**0.0399**	**3.3500e-003**	**0.0432**						**268.1814**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3347	0.0000	0.3347	0.0507	0.0000	0.0507						0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697						3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**0.3347**	**1.7949**	**2.1296**	**0.0507**	**1.6697**	**1.7204**						**3,843.4451**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0145	0.4795	0.0967	1.2400e-003	0.0262	2.4400e-003	0.0286	7.1700e-003	2.3300e-003	9.5000e-003						131.2003
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0604	0.6480	1.3800e-003	0.1232	1.1100e-003	0.1243	0.0327	1.0200e-003	0.0337						136.9811
Total	**0.0876**	**0.5399**	**0.7447**	**2.6200e-003**	**0.1494**	**3.5500e-003**	**0.1529**	**0.0399**	**3.3500e-003**	**0.0432**						**268.1814**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307						0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991						3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**						**3,796.2445**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5146	17.0706	3.4427	0.0441	0.9313	0.0867	1.0181	0.2551	0.0830	0.3381						4,670.7289
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0877	0.0725	0.7776	1.6500e-003	0.1479	1.3300e-003	0.1492	0.0392	1.2300e-003	0.0405						164.3774
Total	**0.6024**	**17.1430**	**4.2203**	**0.0457**	**1.0792**	**0.0880**	**1.1672**	**0.2943**	**0.0842**	**0.3785**						**4,835.1063**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307						0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991						3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**						**3,796.2445**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5146	17.0706	3.4427	0.0441	0.9313	0.0867	1.0181	0.2551	0.0830	0.3381						4,670.7289
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0877	0.0725	0.7776	1.6500e-003	0.1479	1.3300e-003	0.1492	0.0392	1.2300e-003	0.0405						164.3774
Total	**0.6024**	**17.1430**	**4.2203**	**0.0457**	**1.0792**	**0.0880**	**1.1672**	**0.2943**	**0.0842**	**0.3785**						**4,835.1063**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.6135	0.0000	6.6135	3.3767	0.0000	3.3767						0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856						2,960.0361
Total	**2.5805**	**28.3480**	**16.2934**	**0.0297**	**6.6135**	**1.3974**	**8.0108**	**3.3767**	**1.2856**	**4.6623**						**2,960.0361**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3431	11.3804	2.2951	0.0294	0.6209	0.0578	0.6787	0.1701	0.0553	0.2254						3,113.8193
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0604	0.6480	1.3800e-003	0.1232	1.1100e-003	0.1243	0.0327	1.0200e-003	0.0337						136.9811
Total	**0.4162**	**11.4408**	**2.9431**	**0.0308**	**0.7441**	**0.0589**	**0.8030**	**0.2027**	**0.0563**	**0.2591**						**3,250.8004**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.6135	0.0000	6.6135	3.3767	0.0000	3.3767						0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856						2,960.0361
Total	**2.5805**	**28.3480**	**16.2934**	**0.0297**	**6.6135**	**1.3974**	**8.0108**	**3.3767**	**1.2856**	**4.6623**						**2,960.0361**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3431	11.3804	2.2951	0.0294	0.6209	0.0578	0.6787	0.1701	0.0553	0.2254						3,113.8193
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0604	0.6480	1.3800e-003	0.1232	1.1100e-003	0.1243	0.0327	1.0200e-003	0.0337						136.9811
Total	**0.4162**	**11.4408**	**2.9431**	**0.0308**	**0.7441**	**0.0589**	**0.8030**	**0.2027**	**0.0563**	**0.2591**						**3,250.8004**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127						2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**						**2,607.3635**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0109	0.2672	0.0736	5.8000e-004	0.0135	2.0900e-003	0.0156	3.8900e-003	2.0000e-003	5.8900e-003						60.7760
Worker	0.0341	0.0282	0.3024	6.4000e-004	0.0575	5.2000e-004	0.0580	0.0153	4.8000e-004	0.0157						63.9245
Total	**0.0450**	**0.2954**	**0.3760**	**1.2200e-003**	**0.0710**	**2.6100e-003**	**0.0736**	**0.0191**	**2.4800e-003**	**0.0216**						**124.7006**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127						2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**						**2,607.3635**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0109	0.2672	0.0736	5.8000e-004	0.0135	2.0900e-003	0.0156	3.8900e-003	2.0000e-003	5.8900e-003						60.7760
Worker	0.0341	0.0282	0.3024	6.4000e-004	0.0575	5.2000e-004	0.0580	0.0153	4.8000e-004	0.0157						63.9245
Total	**0.0450**	**0.2954**	**0.3760**	**1.2200e-003**	**0.0710**	**2.6100e-003**	**0.0736**	**0.0191**	**2.4800e-003**	**0.0216**						**124.7006**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503						2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**						**2,568.6345**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	8.7300e-003	0.2449	0.0639	5.8000e-004	0.0135	1.3400e-003	0.0149	3.8900e-003	1.2800e-003	5.1700e-003						60.5618
Worker	0.0309	0.0249	0.2690	6.2000e-004	0.0575	5.0000e-004	0.0580	0.0153	4.6000e-004	0.0157						61.9930
Total	**0.0396**	**0.2698**	**0.3329**	**1.2000e-003**	**0.0710**	**1.8400e-003**	**0.0729**	**0.0191**	**1.7400e-003**	**0.0209**						**122.5548**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503						2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**						**2,568.6345**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	8.7300e-003	0.2449	0.0639	5.8000e-004	0.0135	1.3400e-003	0.0149	3.8900e-003	1.2800e-003	5.1700e-003						60.5618
Worker	0.0309	0.0249	0.2690	6.2000e-004	0.0575	5.0000e-004	0.0580	0.0153	4.6000e-004	0.0157						61.9930
Total	**0.0396**	**0.2698**	**0.3329**	**1.2000e-003**	**0.0710**	**1.8400e-003**	**0.0729**	**0.0191**	**1.7400e-003**	**0.0209**						**122.5548**

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.2923					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288						282.0423
Total	**3.5587**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**						**282.0423**

3.6 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	4.8700e-003	4.0300e-003	0.0432	9.0000e-005	8.2100e-003	7.0000e-005	8.2900e-003	2.1800e-003	7.0000e-005	2.2500e-003						9.1321
Total	**4.8700e-003**	**4.0300e-003**	**0.0432**	**9.0000e-005**	**8.2100e-003**	**7.0000e-005**	**8.2900e-003**	**2.1800e-003**	**7.0000e-005**	**2.2500e-003**						**9.1321**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.2923					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288						282.0423
Total	**3.5587**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**						**282.0423**

3.6 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	4.8700e-003	4.0300e-003	0.0432	9.0000e-005	8.2100e-003	7.0000e-005	8.2900e-003	2.1800e-003	7.0000e-005	2.2500e-003						9.1321
Total	**4.8700e-003**	**4.0300e-003**	**0.0432**	**9.0000e-005**	**8.2100e-003**	**7.0000e-005**	**8.2900e-003**	**2.1800e-003**	**7.0000e-005**	**2.2500e-003**						**9.1321**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.2923					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109						281.9928
Total	**3.5345**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	4.4200e-003	3.5600e-003	0.0384	9.0000e-005	8.2100e-003	7.0000e-005	8.2900e-003	2.1800e-003	7.0000e-005	2.2400e-003						8.8561
Total	**4.4200e-003**	**3.5600e-003**	**0.0384**	**9.0000e-005**	**8.2100e-003**	**7.0000e-005**	**8.2900e-003**	**2.1800e-003**	**7.0000e-005**	**2.2400e-003**						**8.8561**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.2923					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109						281.9928
Total	**3.5345**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	4.4200e-003	3.5600e-003	0.0384	9.0000e-005	8.2100e-003	7.0000e-005	8.2900e-003	2.1800e-003	7.0000e-005	2.2400e-003						8.8561
Total	**4.4200e-003**	**3.5600e-003**	**0.0384**	**9.0000e-005**	**8.2100e-003**	**7.0000e-005**	**8.2900e-003**	**2.1800e-003**	**7.0000e-005**	**2.2400e-003**						**8.8561**

3.7 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926						2,225.5841
Paving	0.0000					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**1.3566**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**						**2,225.5841**

3.7 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0662	0.0533	0.5764	1.3300e-003	0.1232	1.0700e-003	0.1243	0.0327	9.8000e-004	0.0337						132.8422
Total	**0.0662**	**0.0533**	**0.5764**	**1.3300e-003**	**0.1232**	**1.0700e-003**	**0.1243**	**0.0327**	**9.8000e-004**	**0.0337**						**132.8422**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926						2,225.5841
Paving	0.0000					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**1.3566**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**						**2,225.5841**

3.7 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0662	0.0533	0.5764	1.3300e-003	0.1232	1.0700e-003	0.1243	0.0327	9.8000e-004	0.0337						132.8422
Total	**0.0662**	**0.0533**	**0.5764**	**1.3300e-003**	**0.1232**	**1.0700e-003**	**0.1243**	**0.0327**	**9.8000e-004**	**0.0337**						**132.8422**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.5231	2.0413	6.0313	0.0158	1.1550	0.0175	1.1725	0.3094	0.0164	0.3259						1,595.9878
Unmitigated	0.5231	2.0413	6.0313	0.0158	1.1550	0.0175	1.1725	0.3094	0.0164	0.3259						1,595.9878

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	180.88	188.29	163.78	517,107	517,107
Total	180.88	188.29	163.78	517,107	517,107

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	44.00	18.80	37.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.533135	0.030877	0.202665	0.141212	0.024955	0.006027	0.018072	0.025901	0.004150	0.002959	0.007890	0.001253	0.000905

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551
NaturalGas Unmitigated	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	1512.98	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551
Total		**0.0163**	**0.1394**	**0.0593**	**8.9000e-004**		**0.0113**	**0.0113**		**0.0113**	**0.0113**						**179.0551**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	1.51298	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551
Total		**0.0163**	**0.1394**	**0.0593**	**8.9000e-004**		**0.0113**	**0.0113**		**0.0113**	**0.0113**						**179.0551**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	13.6155	0.4009	17.9968	0.0317		2.3324	2.3324		2.3324	2.3324						518.3680
Unmitigated	13.6155	0.4009	17.9968	0.0317		2.3324	2.3324		2.3324	2.3324						518.3680

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1173					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.7319					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	12.7185	0.3828	16.4241	0.0316		2.3237	2.3237		2.3237	2.3237						515.4767
Landscaping	0.0479	0.0182	1.5727	8.0000e-005		8.6500e-003	8.6500e-003		8.6500e-003	8.6500e-003						2.8913
Total	**13.6155**	**0.4009**	**17.9968**	**0.0317**		**2.3324**	**2.3324**		**2.3324**	**2.3324**						**518.3680**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1173					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.7319					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	12.7185	0.3828	16.4241	0.0316		2.3237	2.3237		2.3237	2.3237						515.4767
Landscaping	0.0479	0.0182	1.5727	8.0000e-005		8.6500e-003	8.6500e-003		8.6500e-003	8.6500e-003						2.8913
Total	**13.6155**	**0.4009**	**17.9968**	**0.0317**		**2.3324**	**2.3324**		**2.3324**	**2.3324**						**518.3680**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

La Tourette Subdivision - Yr 2020

Monterey County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	19.00	Dwelling Unit	46.37	34,200.00	54

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.6	**Precipitation Freq (Days)**	55
Climate Zone	4			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	488.3	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

La Tourette Subdivision - Yr 2020 - Monterey County, Winter

Project Characteristics - Includes RPS adjustment

Land Use - 19 SFR, 46.37 ac., 34,200 sf.

Construction Phase - Based on model defaults. 20 days demo, 10 days site prep, 20 days grading, 230 days construction, 20 days paving. Arch coating distributed over building phase excluding initial 5-month development period.

Off-road Equipment - Offroad equipment based on model defaults

Trips and VMT - Based on model defaults

Demolition - Demo of 6,500 sf building area per aerial photo interpretation

Grading - Assumes 5,400 cy import plus an additional 300 cy/lot (5700); 11,100 cy total

Architectural Coating - Arch coating based on model defaults

Vehicle Trips - Weekday trip gen based on traffic analysis 9.52/DU, consistent with model default. Weekend trips and trip distances based on model defaults.

Woodstoves - Area source emissions based on model defaults

Energy Use - Energy use based on model defaults, includes RPS adjustments

Water And Wastewater - Water and wastewater based on model defaults.

Solid Waste - Solid waste based on model defaults

Energy Mitigation - Energy mitigation includes installation of solar PV providing minimum 20% electricity demand and energy-efficient lighting and appliances

Water Mitigation - Water mitigation includes installation of low-flow water fixtures and water-efficient irrigation systems.

Waste Mitigation - Solid waste assumes 50% diversion per current statewide avg.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	55.00	130.00
tblConstructionPhase	NumDays	740.00	230.00
tblConstructionPhase	NumDays	50.00	20.00
tblConstructionPhase	NumDays	75.00	20.00
tblConstructionPhase	NumDays	55.00	20.00
tblConstructionPhase	NumDays	30.00	10.00
tblGrading	MaterialImported	0.00	5,700.00
tblGrading	MaterialImported	0.00	5,400.00
tblLandUse	LotAcreage	6.17	46.37

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	641.35	488.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	713.00	712.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblVehicleTrips	HO_TL	7.90	7.50
tblVehicleTrips	HS_TL	7.10	7.30
tblVehicleTrips	HW_TL	16.80	10.80

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	5.9738	63.1646	26.5578	0.0828	19.1455	2.4804	21.6259	10.2250	2.2853	12.5103						8,532.5480
2020	5.7020	21.1534	19.0554	0.0311	0.1232	1.2299	1.3092	0.0327	1.1631	1.1844						2,975.7825
Maximum	**5.9738**	**63.1646**	**26.5578**	**0.0828**	**19.1455**	**2.4804**	**21.6259**	**10.2250**	**2.2853**	**12.5103**						**8,532.5480**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	5.9738	63.1646	26.5578	0.0828	19.1455	2.4804	21.6259	10.2250	2.2853	12.5103						8,532.5480
2020	5.7020	21.1534	19.0554	0.0311	0.1232	1.2299	1.3092	0.0327	1.1631	1.1844						2,975.7824
Maximum	**5.9738**	**63.1646**	**26.5578**	**0.0828**	**19.1455**	**2.4804**	**21.6259**	**10.2250**	**2.2853**	**12.5103**						**8,532.5480**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	13.6155	0.4009	17.9968	0.0317		2.3324	2.3324		2.3324	2.3324						518.3680
Energy	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551
Mobile	0.4920	2.2092	6.2415	0.0150	1.1550	0.0176	1.1727	0.3094	0.0166	0.3260						1,512.3097
Total	**14.1239**	**2.7495**	**24.2976**	**0.0476**	**1.1550**	**2.3613**	**3.5163**	**0.3094**	**2.3602**	**2.6697**						**2,209.7328**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	13.6155	0.4009	17.9968	0.0317		2.3324	2.3324		2.3324	2.3324						518.3680
Energy	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551
Mobile	0.4920	2.2092	6.2415	0.0150	1.1550	0.0176	1.1727	0.3094	0.0166	0.3260						1,512.3097
Total	**14.1239**	**2.7495**	**24.2976**	**0.0476**	**1.1550**	**2.3613**	**3.5163**	**0.3094**	**2.3602**	**2.6697**						**2,209.7328**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/29/2019	2/11/2019	5	10	
3	Grading	Grading	2/12/2019	3/11/2019	5	20	
4	Building Construction	Building Construction	3/12/2019	1/27/2020	5	230	
5	Architectural Coating	Architectural Coating	7/30/2019	1/27/2020	5	130	
6	Paving	Paving	1/28/2020	2/24/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 69,255; Residential Outdoor: 23,085; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating - sqft)

OffRoad Equipment

La Tourette Subdivision - Yr 2020 - Monterey County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	30.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	534.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	712.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	7.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3347	0.0000	0.3347	0.0507	0.0000	0.0507						0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697						3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**0.3347**	**1.7949**	**2.1296**	**0.0507**	**1.6697**	**1.7204**						**3,843.4451**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0149	0.4916	0.1046	1.2100e-003	0.0262	2.4900e-003	0.0287	7.1700e-003	2.3800e-003	9.5500e-003						128.7185
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0797	0.0760	0.6412	1.2900e-003	0.1232	1.1100e-003	0.1243	0.0327	1.0200e-003	0.0337						128.2708
Total	**0.0946**	**0.5676**	**0.7458**	**2.5000e-003**	**0.1494**	**3.6000e-003**	**0.1530**	**0.0399**	**3.4000e-003**	**0.0433**						**256.9893**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.3347	0.0000	0.3347	0.0507	0.0000	0.0507						0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697						3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**0.3347**	**1.7949**	**2.1296**	**0.0507**	**1.6697**	**1.7204**						**3,843.4451**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0149	0.4916	0.1046	1.2100e-003	0.0262	2.4900e-003	0.0287	7.1700e-003	2.3800e-003	9.5500e-003						128.7185
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0797	0.0760	0.6412	1.2900e-003	0.1232	1.1100e-003	0.1243	0.0327	1.0200e-003	0.0337						128.2708
Total	**0.0946**	**0.5676**	**0.7458**	**2.5000e-003**	**0.1494**	**3.6000e-003**	**0.1530**	**0.0399**	**3.4000e-003**	**0.0433**						**256.9893**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307						0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991						3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**						**3,796.2445**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5308	17.5006	3.7254	0.0432	0.9313	0.0887	1.0201	0.2551	0.0849	0.3400						4,582.3785
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0957	0.0912	0.7694	1.5500e-003	0.1479	1.3300e-003	0.1492	0.0392	1.2300e-003	0.0405						153.9249
Total	**0.6264**	**17.5919**	**4.4948**	**0.0448**	**1.0792**	**0.0901**	**1.1693**	**0.2943**	**0.0861**	**0.3804**						**4,736.3034**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307						0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991						3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**18.0663**	**2.3904**	**20.4566**	**9.9307**	**2.1991**	**12.1298**						**3,796.2445**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5308	17.5006	3.7254	0.0432	0.9313	0.0887	1.0201	0.2551	0.0849	0.3400						4,582.3785
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0957	0.0912	0.7694	1.5500e-003	0.1479	1.3300e-003	0.1492	0.0392	1.2300e-003	0.0405						153.9249
Total	**0.6264**	**17.5919**	**4.4948**	**0.0448**	**1.0792**	**0.0901**	**1.1693**	**0.2943**	**0.0861**	**0.3804**						**4,736.3034**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.6135	0.0000	6.6135	3.3767	0.0000	3.3767						0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856						2,960.0361
Total	**2.5805**	**28.3480**	**16.2934**	**0.0297**	**6.6135**	**1.3974**	**8.0108**	**3.3767**	**1.2856**	**4.6623**						**2,960.0361**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3538	11.6671	2.4836	0.0288	0.6209	0.0592	0.6801	0.1701	0.0566	0.2267						3,054.9190
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0797	0.0760	0.6412	1.2900e-003	0.1232	1.1100e-003	0.1243	0.0327	1.0200e-003	0.0337						128.2708
Total	**0.4336**	**11.7431**	**3.1248**	**0.0301**	**0.7441**	**0.0603**	**0.8044**	**0.2027**	**0.0576**	**0.2604**						**3,183.1898**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.6135	0.0000	6.6135	3.3767	0.0000	3.3767						0.0000
Off-Road	2.5805	28.3480	16.2934	0.0297		1.3974	1.3974		1.2856	1.2856						2,960.0361
Total	**2.5805**	**28.3480**	**16.2934**	**0.0297**	**6.6135**	**1.3974**	**8.0108**	**3.3767**	**1.2856**	**4.6623**						**2,960.0361**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.3538	11.6671	2.4836	0.0288	0.6209	0.0592	0.6801	0.1701	0.0566	0.2267						3,054.9190
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0797	0.0760	0.6412	1.2900e-003	0.1232	1.1100e-003	0.1243	0.0327	1.0200e-003	0.0337						128.2708
Total	**0.4336**	**11.7431**	**3.1248**	**0.0301**	**0.7441**	**0.0603**	**0.8044**	**0.2027**	**0.0576**	**0.2604**						**3,183.1898**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127						2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**						**2,607.3635**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0114	0.2710	0.0836	5.6000e-004	0.0135	2.1300e-003	0.0157	3.8900e-003	2.0400e-003	5.9300e-003						59.0721
Worker	0.0372	0.0355	0.2992	6.0000e-004	0.0575	5.2000e-004	0.0580	0.0153	4.8000e-004	0.0157						59.8597
Total	**0.0486**	**0.3065**	**0.3828**	**1.1600e-003**	**0.0710**	**2.6500e-003**	**0.0737**	**0.0191**	**2.5200e-003**	**0.0217**						**118.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127						2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**						**2,607.3635**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0114	0.2710	0.0836	5.6000e-004	0.0135	2.1300e-003	0.0157	3.8900e-003	2.0400e-003	5.9300e-003						59.0721
Worker	0.0372	0.0355	0.2992	6.0000e-004	0.0575	5.2000e-004	0.0580	0.0153	4.8000e-004	0.0157						59.8597
Total	**0.0486**	**0.3065**	**0.3828**	**1.1600e-003**	**0.0710**	**2.6500e-003**	**0.0737**	**0.0191**	**2.5200e-003**	**0.0217**						**118.9318**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503						2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**						**2,568.6345**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	9.2300e-003	0.2477	0.0730	5.6000e-004	0.0135	1.3700e-003	0.0149	3.8900e-003	1.3100e-003	5.2100e-003						58.8167
Worker	0.0337	0.0313	0.2647	5.8000e-004	0.0575	5.0000e-004	0.0580	0.0153	4.6000e-004	0.0157						58.0462
Total	**0.0429**	**0.2791**	**0.3376**	**1.1400e-003**	**0.0710**	**1.8700e-003**	**0.0729**	**0.0191**	**1.7700e-003**	**0.0209**						**116.8628**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503						2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**						**2,568.6345**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	9.2300e-003	0.2477	0.0730	5.6000e-004	0.0135	1.3700e-003	0.0149	3.8900e-003	1.3100e-003	5.2100e-003						58.8167
Worker	0.0337	0.0313	0.2647	5.8000e-004	0.0575	5.0000e-004	0.0580	0.0153	4.6000e-004	0.0157						58.0462
Total	**0.0429**	**0.2791**	**0.3376**	**1.1400e-003**	**0.0710**	**1.8700e-003**	**0.0729**	**0.0191**	**1.7700e-003**	**0.0209**						**116.8628**

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.2923					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288						282.0423
Total	**3.5587**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**						**282.0423**

3.6 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	5.3100e-003	5.0700e-003	0.0428	9.0000e-005	8.2100e-003	7.0000e-005	8.2900e-003	2.1800e-003	7.0000e-005	2.2500e-003						8.5514
Total	**5.3100e-003**	**5.0700e-003**	**0.0428**	**9.0000e-005**	**8.2100e-003**	**7.0000e-005**	**8.2900e-003**	**2.1800e-003**	**7.0000e-005**	**2.2500e-003**						**8.5514**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.2923					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288						282.0423
Total	**3.5587**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**						**282.0423**

3.6 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	5.3100e-003	5.0700e-003	0.0428	9.0000e-005	8.2100e-003	7.0000e-005	8.2900e-003	2.1800e-003	7.0000e-005	2.2500e-003						8.5514
Total	**5.3100e-003**	**5.0700e-003**	**0.0428**	**9.0000e-005**	**8.2100e-003**	**7.0000e-005**	**8.2900e-003**	**2.1800e-003**	**7.0000e-005**	**2.2500e-003**						**8.5514**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.2923					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109						281.9928
Total	**3.5345**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	4.8100e-003	4.4800e-003	0.0378	8.0000e-005	8.2100e-003	7.0000e-005	8.2900e-003	2.1800e-003	7.0000e-005	2.2400e-003						8.2923
Total	**4.8100e-003**	**4.4800e-003**	**0.0378**	**8.0000e-005**	**8.2100e-003**	**7.0000e-005**	**8.2900e-003**	**2.1800e-003**	**7.0000e-005**	**2.2400e-003**						**8.2923**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.2923					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109						281.9928
Total	**3.5345**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	4.8100e-003	4.4800e-003	0.0378	8.0000e-005	8.2100e-003	7.0000e-005	8.2900e-003	2.1800e-003	7.0000e-005	2.2400e-003						8.2923
Total	**4.8100e-003**	**4.4800e-003**	**0.0378**	**8.0000e-005**	**8.2100e-003**	**7.0000e-005**	**8.2900e-003**	**2.1800e-003**	**7.0000e-005**	**2.2400e-003**						**8.2923**

3.7 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926						2,225.5841
Paving	0.0000					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**1.3566**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**						**2,225.5841**

3.7 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0721	0.0672	0.5671	1.2500e-003	0.1232	1.0700e-003	0.1243	0.0327	9.8000e-004	0.0337						124.3846
Total	**0.0721**	**0.0672**	**0.5671**	**1.2500e-003**	**0.1232**	**1.0700e-003**	**0.1243**	**0.0327**	**9.8000e-004**	**0.0337**						**124.3846**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926						2,225.5841
Paving	0.0000					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**1.3566**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**						**2,225.5841**

3.7 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0721	0.0672	0.5671	1.2500e-003	0.1232	1.0700e-003	0.1243	0.0327	9.8000e-004	0.0337						124.3846
Total	**0.0721**	**0.0672**	**0.5671**	**1.2500e-003**	**0.1232**	**1.0700e-003**	**0.1243**	**0.0327**	**9.8000e-004**	**0.0337**						**124.3846**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.4920	2.2092	6.2415	0.0150	1.1550	0.0176	1.1727	0.3094	0.0166	0.3260						1,512.3097
Unmitigated	0.4920	2.2092	6.2415	0.0150	1.1550	0.0176	1.1727	0.3094	0.0166	0.3260						1,512.3097

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	180.88	188.29	163.78	517,107	517,107
Total	180.88	188.29	163.78	517,107	517,107

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	44.00	18.80	37.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.533135	0.030877	0.202665	0.141212	0.024955	0.006027	0.018072	0.025901	0.004150	0.002959	0.007890	0.001253	0.000905

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551
NaturalGas Unmitigated	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	1512.98	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551
Total		**0.0163**	**0.1394**	**0.0593**	**8.9000e-004**		**0.0113**	**0.0113**		**0.0113**	**0.0113**						**179.0551**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	1.51298	0.0163	0.1394	0.0593	8.9000e-004		0.0113	0.0113		0.0113	0.0113						179.0551
Total		**0.0163**	**0.1394**	**0.0593**	**8.9000e-004**		**0.0113**	**0.0113**		**0.0113**	**0.0113**						**179.0551**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	13.6155	0.4009	17.9968	0.0317		2.3324	2.3324		2.3324	2.3324						518.3680
Unmitigated	13.6155	0.4009	17.9968	0.0317		2.3324	2.3324		2.3324	2.3324						518.3680

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1173					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.7319					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	12.7185	0.3828	16.4241	0.0316		2.3237	2.3237		2.3237	2.3237						515.4767
Landscaping	0.0479	0.0182	1.5727	8.0000e-005		8.6500e-003	8.6500e-003		8.6500e-003	8.6500e-003						2.8913
Total	**13.6155**	**0.4009**	**17.9968**	**0.0317**		**2.3324**	**2.3324**		**2.3324**	**2.3324**						**518.3680**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1173					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.7319					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	12.7185	0.3828	16.4241	0.0316		2.3237	2.3237		2.3237	2.3237						515.4767
Landscaping	0.0479	0.0182	1.5727	8.0000e-005		8.6500e-003	8.6500e-003		8.6500e-003	8.6500e-003						2.8913
Total	**13.6155**	**0.4009**	**17.9968**	**0.0317**		**2.3324**	**2.3324**		**2.3324**	**2.3324**						**518.3680**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

La Tourette Subdivision - Yr 2020

Monterey County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	19.00	Dwelling Unit	46.37	34,200.00	54

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.6	**Precipitation Freq (Days)**	55
Climate Zone	4			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	488.3	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

La Tourette Subdivision - Yr 2020 - Monterey County, Annual

Project Characteristics - Includes RPS adjustment

Land Use - 19 SFR, 46.37 ac., 34,200 sf.

Construction Phase - Based on model defaults. 20 days demo, 10 days site prep, 20 days grading, 230 days construction, 20 days paving. Arch coating distributed over building phase excluding initial 5-month development period.

Off-road Equipment - Offroad equipment based on model defaults

Trips and VMT - Based on model defaults

Demolition - Demo of 6,500 sf building area per aerial photo interpretation

Grading - Assumes 5,400 cy import plus an additional 300 cy/lot (5700); 11,100 cy total

Architectural Coating - Arch coating based on model defaults

Vehicle Trips - Weekday trip gen based on traffic analysis 9.52/DU, consistent with model default. Weekend trips and trip distances based on model defaults.

Woodstoves - Area source emissions based on model defaults

Energy Use - Energy use based on model defaults, includes RPS adjustments

Water And Wastewater - Water and wastewater based on model defaults.

Solid Waste - Solid waste based on model defaults

Energy Mitigation - Energy mitigation includes installation of solar PV providing minimum 20% electricity demand and energy-efficient lighting and appliances

Water Mitigation - Water mitigation includes installation of low-flow water fixtures and water-efficient irrigation systems.

Waste Mitigation - Solid waste assumes 50% diversion per current statewide avg.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	55.00	130.00
tblConstructionPhase	NumDays	740.00	230.00
tblConstructionPhase	NumDays	50.00	20.00
tblConstructionPhase	NumDays	75.00	20.00
tblConstructionPhase	NumDays	55.00	20.00
tblConstructionPhase	NumDays	30.00	10.00
tblGrading	MaterialImported	0.00	5,700.00
tblGrading	MaterialImported	0.00	5,400.00
tblLandUse	LotAcreage	6.17	46.37

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	641.35	488.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	713.00	712.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblVehicleTrips	HO_TL	7.90	7.50
tblVehicleTrips	HS_TL	7.10	7.30
tblVehicleTrips	HW_TL	16.80	10.80

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.5424	3.4375	2.5062	4.5600e-003	0.1814	0.1885	0.3699	0.0898	0.1769	0.2667						407.8946
2020	0.0684	0.3422	0.3329	5.4000e-004	1.9200e-003	0.0192	0.0211	5.1000e-004	0.0180	0.0185						46.9832
Maximum	**0.5424**	**3.4375**	**2.5062**	**4.5600e-003**	**0.1814**	**0.1885**	**0.3699**	**0.0898**	**0.1769**	**0.2667**						**407.8946**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.5424	3.4375	2.5062	4.5600e-003	0.1814	0.1885	0.3699	0.0898	0.1769	0.2667						407.8942
2020	0.0684	0.3422	0.3329	5.4000e-004	1.9200e-003	0.0192	0.0211	5.1000e-004	0.0180	0.0185						46.9832
Maximum	**0.5424**	**3.4375**	**2.5062**	**4.5600e-003**	**0.1814**	**0.1885**	**0.3699**	**0.0898**	**0.1769**	**0.2667**						**407.8942**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2019	3-31-2019	1.3412	1.3412
2	4-1-2019	6-30-2019	0.7729	0.7729
3	7-1-2019	9-30-2019	0.9029	0.9029
4	10-1-2019	12-31-2019	0.9594	0.9594
5	1-1-2020	3-31-2020	0.4146	0.4146
		Highest	1.3412	1.3412

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6824	0.0180	0.8700	1.3100e-003		0.0964	0.0964		0.0964	0.0964						19.5008
Energy	2.9800e-003	0.0255	0.0108	1.6000e-004		2.0600e-003	2.0600e-003		2.0600e-003	2.0600e-003						63.8343
Mobile	0.0849	0.3720	1.0262	2.6200e-003	0.1940	3.0400e-003	0.1970	0.0521	2.8600e-003	0.0550						239.5425
Waste						0.0000	0.0000		0.0000	0.0000						11.9489
Water						0.0000	0.0000		0.0000	0.0000						3.7824
Total	**0.7703**	**0.4154**	**1.9070**	**4.0900e-003**	**0.1940**	**0.1015**	**0.2954**	**0.0521**	**0.1013**	**0.1534**						**338.6089**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.6824	0.0180	0.8700	1.3100e-003		0.0964	0.0964		0.0964	0.0964						19.5008
Energy	2.9800e-003	0.0255	0.0108	1.6000e-004		2.0600e-003	2.0600e-003		2.0600e-003	2.0600e-003						55.6756
Mobile	0.0849	0.3720	1.0262	2.6200e-003	0.1940	3.0400e-003	0.1970	0.0521	2.8600e-003	0.0550						239.5425
Waste						0.0000	0.0000		0.0000	0.0000						5.9745
Water						0.0000	0.0000		0.0000	0.0000						3.1103
Total	**0.7703**	**0.4154**	**1.9070**	**4.0900e-003**	**0.1940**	**0.1015**	**0.2954**	**0.0521**	**0.1013**	**0.1534**						**323.8037**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**4.37**

3.0 Construction Detail

Construction Phase

La Tourette Subdivision - Yr 2020 - Monterey County, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	
2	Site Preparation	Site Preparation	1/29/2019	2/11/2019	5	10	
3	Grading	Grading	2/12/2019	3/11/2019	5	20	
4	Building Construction	Building Construction	3/12/2019	1/27/2020	5	230	
5	Architectural Coating	Architectural Coating	7/30/2019	1/27/2020	5	130	
6	Paving	Paving	1/28/2020	2/24/2020	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 69,255; Residential Outdoor: 23,085; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating - sqft)

OffRoad Equipment

La Tourette Subdivision - Yr 2020 - Monterey County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	30.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	534.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	712.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	7.00	2.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.3500e-003	0.0000	3.3500e-003	5.1000e-004	0.0000	5.1000e-004						0.0000
Off-Road	0.0351	0.3578	0.2206	3.9000e-004		0.0180	0.0180		0.0167	0.0167						34.8672
Total	**0.0351**	**0.3578**	**0.2206**	**3.9000e-004**	**3.3500e-003**	**0.0180**	**0.0213**	**5.1000e-004**	**0.0167**	**0.0172**						**34.8672**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9000e-003	1.0000e-003	1.0000e-005	2.5000e-004	2.0000e-005	2.8000e-004	7.0000e-005	2.0000e-005	9.0000e-005						1.1808
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	7.3000e-004	6.9000e-004	6.1600e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.1704
Total	**8.8000e-004**	**5.5900e-003**	**7.1600e-003**	**2.0000e-005**	**1.4400e-003**	**3.0000e-005**	**1.4800e-003**	**3.9000e-004**	**3.0000e-005**	**4.2000e-004**						**2.3512**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.3500e-003	0.0000	3.3500e-003	5.1000e-004	0.0000	5.1000e-004						0.0000
Off-Road	0.0351	0.3578	0.2206	3.9000e-004		0.0180	0.0180		0.0167	0.0167						34.8671
Total	**0.0351**	**0.3578**	**0.2206**	**3.9000e-004**	**3.3500e-003**	**0.0180**	**0.0213**	**5.1000e-004**	**0.0167**	**0.0172**						**34.8671**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9000e-003	1.0000e-003	1.0000e-005	2.5000e-004	2.0000e-005	2.8000e-004	7.0000e-005	2.0000e-005	9.0000e-005						1.1808
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	7.3000e-004	6.9000e-004	6.1600e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.1704
Total	**8.8000e-004**	**5.5900e-003**	**7.1600e-003**	**2.0000e-005**	**1.4400e-003**	**3.0000e-005**	**1.4800e-003**	**3.9000e-004**	**3.0000e-005**	**4.2000e-004**						**2.3512**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497						0.0000
Off-Road	0.0217	0.2279	0.1103	1.9000e-004		0.0120	0.0120		0.0110	0.0110						17.2195
Total	**0.0217**	**0.2279**	**0.1103**	**1.9000e-004**	**0.0903**	**0.0120**	**0.1023**	**0.0497**	**0.0110**	**0.0607**						**17.2195**

3.3 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.6100e-003	0.0873	0.0178	2.2000e-004	4.5200e-003	4.4000e-004	4.9600e-003	1.2400e-003	4.2000e-004	1.6600e-003						21.0178
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	4.4000e-004	4.1000e-004	3.7000e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	2.0000e-004						0.7023
Total	**3.0500e-003**	**0.0877**	**0.0215**	**2.3000e-004**	**5.2400e-003**	**4.5000e-004**	**5.6800e-003**	**1.4300e-003**	**4.3000e-004**	**1.8600e-003**						**21.7200**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497						0.0000
Off-Road	0.0217	0.2279	0.1103	1.9000e-004		0.0120	0.0120		0.0110	0.0110						17.2195
Total	**0.0217**	**0.2279**	**0.1103**	**1.9000e-004**	**0.0903**	**0.0120**	**0.1023**	**0.0497**	**0.0110**	**0.0607**						**17.2195**

3.3 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.6100e-003	0.0873	0.0178	2.2000e-004	4.5200e-003	4.4000e-004	4.9600e-003	1.2400e-003	4.2000e-004	1.6600e-003						21.0178
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	4.4000e-004	4.1000e-004	3.7000e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.2000e-004	1.9000e-004	1.0000e-005	2.0000e-004						0.7023
Total	**3.0500e-003**	**0.0877**	**0.0215**	**2.3000e-004**	**5.2400e-003**	**4.5000e-004**	**5.6800e-003**	**1.4300e-003**	**4.3000e-004**	**1.8600e-003**						**21.7200**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0661	0.0000	0.0661	0.0338	0.0000	0.0338						0.0000
Off-Road	0.0258	0.2835	0.1629	3.0000e-004		0.0140	0.0140		0.0129	0.0129						26.8530
Total	**0.0258**	**0.2835**	**0.1629**	**3.0000e-004**	**0.0661**	**0.0140**	**0.0801**	**0.0338**	**0.0129**	**0.0466**						**26.8530**

3.4 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.4800e-003	0.1164	0.0237	2.9000e-004	6.0300e-003	5.8000e-004	6.6200e-003	1.6600e-003	5.6000e-004	2.2200e-003						28.0237
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	7.3000e-004	6.9000e-004	6.1600e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.1704
Total	**4.2100e-003**	**0.1171**	**0.0299**	**3.0000e-004**	**7.2200e-003**	**5.9000e-004**	**7.8200e-003**	**1.9800e-003**	**5.7000e-004**	**2.5500e-003**						**29.1941**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0661	0.0000	0.0661	0.0338	0.0000	0.0338						0.0000
Off-Road	0.0258	0.2835	0.1629	3.0000e-004		0.0140	0.0140		0.0129	0.0129						26.8530
Total	**0.0258**	**0.2835**	**0.1629**	**3.0000e-004**	**0.0661**	**0.0140**	**0.0801**	**0.0338**	**0.0129**	**0.0466**						**26.8530**

3.4 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.4800e-003	0.1164	0.0237	2.9000e-004	6.0300e-003	5.8000e-004	6.6200e-003	1.6600e-003	5.6000e-004	2.2200e-003						28.0237
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	7.3000e-004	6.9000e-004	6.1600e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.1704
Total	**4.2100e-003**	**0.1171**	**0.0299**	**3.0000e-004**	**7.2200e-003**	**5.9000e-004**	**7.8200e-003**	**1.9800e-003**	**5.7000e-004**	**2.5500e-003**						**29.1941**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2491	2.2238	1.8108	2.8400e-003		0.1361	0.1361		0.1279	0.1279						249.5455
Total	**0.2491**	**2.2238**	**1.8108**	**2.8400e-003**		**0.1361**	**0.1361**		**0.1279**	**0.1279**						**249.5455**

3.5 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	1.1700e-003	0.0286	8.2300e-003	6.0000e-005	1.3900e-003	2.2000e-004	1.6100e-003	4.0000e-004	2.1000e-004	6.1000e-004						5.7482
Worker	3.5700e-003	3.4000e-003	0.0303	6.0000e-005	5.8700e-003	5.0000e-005	5.9200e-003	1.5600e-003	5.0000e-005	1.6100e-003						5.7624
Total	**4.7400e-003**	**0.0320**	**0.0386**	**1.2000e-004**	**7.2600e-003**	**2.7000e-004**	**7.5300e-003**	**1.9600e-003**	**2.6000e-004**	**2.2200e-003**						**11.5106**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2491	2.2238	1.8108	2.8400e-003		0.1361	0.1361		0.1279	0.1279						249.5452
Total	**0.2491**	**2.2238**	**1.8108**	**2.8400e-003**		**0.1361**	**0.1361**		**0.1279**	**0.1279**						**249.5452**

3.5 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	1.1700e-003	0.0286	8.2300e-003	6.0000e-005	1.3900e-003	2.2000e-004	1.6100e-003	4.0000e-004	2.1000e-004	6.1000e-004						5.7482
Worker	3.5700e-003	3.4000e-003	0.0303	6.0000e-005	5.8700e-003	5.0000e-005	5.9200e-003	1.5600e-003	5.0000e-005	1.6100e-003						5.7624
Total	**4.7400e-003**	**0.0320**	**0.0386**	**1.2000e-004**	**7.2600e-003**	**2.7000e-004**	**7.5300e-003**	**1.9600e-003**	**2.6000e-004**	**2.2200e-003**						**11.5106**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0201	0.1823	0.1601	2.6000e-004		0.0106	0.0106		9.9800e-003	9.9800e-003						22.1372
Total	**0.0201**	**0.1823**	**0.1601**	**2.6000e-004**		**0.0106**	**0.0106**		**9.9800e-003**	**9.9800e-003**						**22.1372**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	8.0000e-005	2.3600e-003	6.5000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.4000e-004	4.0000e-005	1.0000e-005	5.0000e-005						0.5156
Worker	2.9000e-004	2.7000e-004	2.4200e-003	1.0000e-005	5.3000e-004	0.0000	5.3000e-004	1.4000e-004	0.0000	1.4000e-004						0.5032
Total	**3.7000e-004**	**2.6300e-003**	**3.0700e-003**	**2.0000e-005**	**6.6000e-004**	**1.0000e-005**	**6.7000e-004**	**1.8000e-004**	**1.0000e-005**	**1.9000e-004**						**1.0188**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0201	0.1823	0.1601	2.6000e-004		0.0106	0.0106		9.9800e-003	9.9800e-003						22.1371
Total	**0.0201**	**0.1823**	**0.1601**	**2.6000e-004**		**0.0106**	**0.0106**		**9.9800e-003**	**9.9800e-003**						**22.1371**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	8.0000e-005	2.3600e-003	6.5000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.4000e-004	4.0000e-005	1.0000e-005	5.0000e-005						0.5156
Worker	2.9000e-004	2.7000e-004	2.4200e-003	1.0000e-005	5.3000e-004	0.0000	5.3000e-004	1.4000e-004	0.0000	1.4000e-004						0.5032
Total	**3.7000e-004**	**2.6300e-003**	**3.0700e-003**	**2.0000e-005**	**6.6000e-004**	**1.0000e-005**	**6.7000e-004**	**1.8000e-004**	**1.0000e-005**	**1.9000e-004**						**1.0188**

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1827					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0148	0.1019	0.1022	1.6000e-004		7.1500e-003	7.1500e-003		7.1500e-003	7.1500e-003						14.2005
Total	**0.1975**	**0.1019**	**0.1022**	**1.6000e-004**		**7.1500e-003**	**7.1500e-003**		**7.1500e-003**	**7.1500e-003**						**14.2005**

3.6 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	2.7000e-004	2.6000e-004	2.2800e-003	0.0000	4.4000e-004	0.0000	4.5000e-004	1.2000e-004	0.0000	1.2000e-004						0.4331
Total	**2.7000e-004**	**2.6000e-004**	**2.2800e-003**	**0.0000**	**4.4000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**						**0.4331**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1827					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0148	0.1019	0.1022	1.6000e-004		7.1500e-003	7.1500e-003		7.1500e-003	7.1500e-003						14.2005
Total	**0.1975**	**0.1019**	**0.1022**	**1.6000e-004**		**7.1500e-003**	**7.1500e-003**		**7.1500e-003**	**7.1500e-003**						**14.2005**

3.6 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	2.7000e-004	2.6000e-004	2.2800e-003	0.0000	4.4000e-004	0.0000	4.5000e-004	1.2000e-004	0.0000	1.2000e-004						0.4331
Total	**2.7000e-004**	**2.6000e-004**	**2.2800e-003**	**0.0000**	**4.4000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**						**0.4331**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0313					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	2.3000e-003	0.0160	0.0174	3.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003						2.4303
Total	**0.0336**	**0.0160**	**0.0174**	**3.0000e-005**		**1.0500e-003**	**1.0500e-003**		**1.0500e-003**	**1.0500e-003**						**2.4303**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	4.0000e-005	4.0000e-005	3.5000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005						0.0719
Total	**4.0000e-005**	**4.0000e-005**	**3.5000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**						**0.0719**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0313					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	2.3000e-003	0.0160	0.0174	3.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003						2.4303
Total	**0.0336**	**0.0160**	**0.0174**	**3.0000e-005**		**1.0500e-003**	**1.0500e-003**		**1.0500e-003**	**1.0500e-003**						**2.4303**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	4.0000e-005	4.0000e-005	3.5000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005						0.0719
Total	**4.0000e-005**	**4.0000e-005**	**3.5000e-004**	**0.0000**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**						**0.0719**

3.7 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0136	0.1407	0.1465	2.3000e-004		7.5300e-003	7.5300e-003		6.9300e-003	6.9300e-003						20.1902
Paving	0.0000					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.0136**	**0.1407**	**0.1465**	**2.3000e-004**		**7.5300e-003**	**7.5300e-003**		**6.9300e-003**	**6.9300e-003**						**20.1902**

3.7 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	6.6000e-004	6.1000e-004	5.4600e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.1350
Total	**6.6000e-004**	**6.1000e-004**	**5.4600e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.2000e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**						**1.1350**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0136	0.1407	0.1465	2.3000e-004		7.5300e-003	7.5300e-003		6.9300e-003	6.9300e-003						20.1901
Paving	0.0000					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.0136**	**0.1407**	**0.1465**	**2.3000e-004**		**7.5300e-003**	**7.5300e-003**		**6.9300e-003**	**6.9300e-003**						**20.1901**

3.7 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	6.6000e-004	6.1000e-004	5.4600e-003	1.0000e-005	1.1900e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.1350
Total	**6.6000e-004**	**6.1000e-004**	**5.4600e-003**	**1.0000e-005**	**1.1900e-003**	**1.0000e-005**	**1.2000e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**						**1.1350**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0849	0.3720	1.0262	2.6200e-003	0.1940	3.0400e-003	0.1970	0.0521	2.8600e-003	0.0550						239.5425
Unmitigated	0.0849	0.3720	1.0262	2.6200e-003	0.1940	3.0400e-003	0.1970	0.0521	2.8600e-003	0.0550						239.5425

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	180.88	188.29	163.78	517,107	517,107
Total	180.88	188.29	163.78	517,107	517,107

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	44.00	18.80	37.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.533135	0.030877	0.202665	0.141212	0.024955	0.006027	0.018072	0.025901	0.004150	0.002959	0.007890	0.001253	0.000905

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						26.0310
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						34.1897
NaturalGas Mitigated	2.9800e-003	0.0255	0.0108	1.6000e-004		2.0600e-003	2.0600e-003		2.0600e-003	2.0600e-003						29.6446
NaturalGas Unmitigated	2.9800e-003	0.0255	0.0108	1.6000e-004		2.0600e-003	2.0600e-003		2.0600e-003	2.0600e-003						29.6446

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	552237	2.9800e-003	0.0255	0.0108	1.6000e-004		2.0600e-003	2.0600e-003		2.0600e-003	2.0600e-003						29.6446
Total		**2.9800e-003**	**0.0255**	**0.0108**	**1.6000e-004**		**2.0600e-003**	**2.0600e-003**		**2.0600e-003**	**2.0600e-003**						**29.6446**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	552237	2.9800e-003	0.0255	0.0108	1.6000e-004		2.0600e-003	2.0600e-003		2.0600e-003	2.0600e-003						29.6446
Total		**2.9800e-003**	**0.0255**	**0.0108**	**1.6000e-004**		**2.0600e-003**	**2.0600e-003**		**2.0600e-003**	**2.0600e-003**						**29.6446**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	153721				34.1897
Total					**34.1897**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	117038				26.0310
Total					**26.0310**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6824	0.0180	0.8700	1.3100e-003		0.0964	0.0964		0.0964	0.0964						19.5008
Unmitigated	0.6824	0.0180	0.8700	1.3100e-003		0.0964	0.0964		0.0964	0.0964						19.5008

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0214					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.1336					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.5215	0.0157	0.6734	1.3000e-003		0.0953	0.0953		0.0953	0.0953						19.1729
Landscaping	5.9900e-003	2.2700e-003	0.1966	1.0000e-005		1.0800e-003	1.0800e-003		1.0800e-003	1.0800e-003						0.3279
Total	**0.6824**	**0.0180**	**0.8700**	**1.3100e-003**		**0.0964**	**0.0964**		**0.0964**	**0.0964**						**19.5008**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0214					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.1336					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.5215	0.0157	0.6734	1.3000e-003		0.0953	0.0953		0.0953	0.0953						19.1729
Landscaping	5.9900e-003	2.2700e-003	0.1966	1.0000e-005		1.0800e-003	1.0800e-003		1.0800e-003	1.0800e-003						0.3279
Total	**0.6824**	**0.0180**	**0.8700**	**1.3100e-003**		**0.0964**	**0.0964**		**0.0964**	**0.0964**						**19.5008**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				3.1103
Unmitigated				3.7824

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	1.23793 / 0.780432				3.7824
Total					**3.7824**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.990341 / 0.732826				3.1103
Total					**3.1103**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				5.9745
Unmitigated				11.9489

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	23.76				11.9489
Total					**11.9489**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	11.88				5.9745
Total					**5.9745**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

La Tourette Subdivision - Yr 2030 GHGs

Monterey County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	19.00	Dwelling Unit	46.37	34,200.00	54

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.6	**Precipitation Freq (Days)**	55
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	364.4	**CH4 Intensity (lb/MWhr)**	0.016	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment

Land Use - 19 SFR, 46.37 ac., 34,200 sf. based on model default

Construction Phase - Excludes construction

Off-road Equipment - Excludes construction

Grading - Excludes construction

Demolition - Excludes construction

Trips and VMT - Excludes construction

Architectural Coating - Excludes construction

Vehicle Trips - Weekday trip gen based on traffic analysis 9.52/DU, consistent with model default. Weekend trips and trip distances based on model defaults.

Woodstoves - Area source emissions based on model defaults

Energy Use - Energy use based on model defaults, includes RPS adjustments

Water And Wastewater - Water and wastewater based on model defaults.

Solid Waste - Solid waste based on model defaults

Construction Off-road Equipment Mitigation - N/A

Area Mitigation -

Energy Mitigation - Includes installation of solar PV systems providing minimum 20% energy demand, installation of high-efficiency lighting, use of energy-efficient appliances.

Water Mitigation - Includes installation of low-flow water fixtures, water-efficient irrigation systems

Waste Mitigation - Includes 50% waste diversion per statewide average.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	10.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.016
tblProjectCharacteristics	CO2IntensityFactor	641.35	364.4
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	30.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	10.80

tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblVehicleTrips	HO_TL	7.90	7.50
tblVehicleTrips	HS_TL	7.10	7.30
tblVehicleTrips	HW_TL	16.80	10.80

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019																34.8672
Maximum																**34.8672**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019																34.8671
Maximum																**34.8671**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area																19.5006
Energy																55.1640
Mobile																239.5425
Waste																11.9489
Water																3.2505
Total																**329.4065**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area																19.5006
Energy																48.9863
Mobile																239.5425
Waste																5.9745
Water																2.6634
Total																**316.6673**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.87**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2019	1/28/2019	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating - sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust																0.0000
Off-Road																34.8672
Total																**34.8672**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling																0.0000
Vendor																0.0000
Worker																0.0000
Total																**0.0000**

3.2 Demolition - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust																0.0000
Off-Road																34.8671
Total																**34.8671**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling																0.0000
Vendor																0.0000
Worker																0.0000
Total																**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated																239.5425
Unmitigated																239.5425

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	180.88	188.29	163.78	517,107	517,107
Total	180.88	188.29	163.78	517,107	517,107

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	7.30	7.50	44.00	18.80	37.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.533135	0.030877	0.202665	0.141212	0.024955	0.006027	0.018072	0.025901	0.004150	0.002959	0.007890	0.001253	0.000905

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated																19.3417
Electricity Unmitigated																25.5194
NaturalGas Mitigated																29.6446
NaturalGas Unmitigated																29.6446

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	552237																29.6446
Total																	**29.6446**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	552237																29.6446
Total																	**29.6446**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	153721				25.5194
Total					**25.5194**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	116509				19.3417
Total					**19.3417**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated																19.5006
Unmitigated																19.5006

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating																0.0000
Consumer Products																0.0000
Hearth																19.1729
Landscaping																0.3277
Total																**19.5006**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating																0.0000
Consumer Products																0.0000
Hearth																19.1729
Landscaping																0.3277
Total																**19.5006**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				2.6634
Unmitigated				3.2505

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	1.23793 / 0.780432				3.2505
Total					**3.2505**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.990341 / 0.732826				2.6634
Total					**2.6634**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				5.9745
Unmitigated				11.9489

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	23.76				11.9489
Total					**11.9489**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	11.88				5.9745
Total					**5.9745**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Denise Duffy & Associates, Inc.
PLANNING AND ENVIRONMENTAL CONSULTING

MEMORANDUM

TO: Anna Ginette Quenga, AICP, Principal Planner, Monterey County HCD - Planning

CC: Tyler Potter, JD, AICP, Project Director, Denise Duffy & Associates
Oliviya Wyse, Deputy Project Manager, Denise Duffy & Associates

FROM: Conor O'Toole, Deputy Project Manager, Denise Duffy & Associates

DATE: September 12, 2024

SUBJECT: LaTourette Subdivision Project – Supplemental Air Quality & Greenhouse Gas Memorandum

I. Introduction

This memorandum presents the results of the Supplemental Air Quality ("AQ") and Greenhouse Gas ("GHG") modeling for the LaTourette Subdivision Project ("Proposed Project") for the County of Monterey Housing and Community Development - Planning ("HCD"). Ambient Air Quality & Noise Consulting ("Ambient") previously prepared an analysis titled *Air Quality & Greenhouse Gas Impact Assessment for La Tourette Subdivision Project,* dated June 2018. Changes to grading quantities in the intervening time required an update to the analysis as discussed below. This memorandum summarizes 1) the results of Ambient's previous analysis, 2) the changes to the Proposed Project, and 3) the findings of the Supplemental AQ & GHG analysis.

II. Previous Analysis

Air Quality Emissions

Ambient quantified short-term emissions using CalEEMod version 2016.3.2 in 2018. Ambient's approach included an estimated 6,500 square feet of demolition of existing structures and a total of approximately 11,100 cubic yards ("cy") of fill. Modeling assumptions included off-road equipment usage, worker and vendor vehicle trips, trip distances, and fleet mix utilized CalEEMod modeling defaults for Monterey County.

Ambient determined that the construction of the Proposed Project would not result in a cumulatively considerable net increase in any criteria pollutant during project construction. Specifically, the Proposed Project would generate maximum daily PM_{10} (particulate matter 10 micrometers or less in diameter) emissions of approximately 21.7 lbs/day. Emissions of particulate matter would largely occur during the site preparation and grading activities. Construction activities would not generate PM10 emissions that would exceed the Monterey Bay Air Resources District ("MBARD's") significance threshold of 82 lbs/day.

The MBARD has not identified significance thresholds for Reactive Organic Gases ("ROG"), Nitrogen Oxide ("NO_X"), or $PM_{2.5}$ (particulate matter 2.5 micrometers or less in diameter). Emissions of ROG and NO_X are accommodated in the emission inventories of State- and federally-required air plans and would not have a significant impact on the attainment and maintenance of ozone ambient air quality standards ("AAQS"). Emissions of $PM_{2.5}$ are a component of PM_{10}. Therefore, Ambient did not compare construction emissions of these pollutants against any thresholds. **Table 1** illustrates the construction emissions of criteria air pollutants from Ambient's analysis.

Table 1
Construction Emissions of Criteria Air Pollutants

Construction Activity	ROG (lbs/day)	NO_X (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Demolition - On-Site:	3.5	35.8	2.1	1.7
Demolition - Off-Site:	0.1	0.6	0.2	0.1
Demolition - Total:	**3.6**	**36.4**	**2.3**	**1.8**
Site Preparation - On-Site:	4.3	45.6	20.5	12.1
Site Preparation - Off-Site:	0.6	17.6	1.2	0.4
Site Preparation - Total:	**4.9**	**63.2**	**21.7**	**12.5**
Grading - On-Site:	2.6	28.4	8.0	4.7
Grading - Off-Site:	0.4	11.7	0.8	0.3
Grading - Total:	**3.0**	**40.1**	**8.8**	**5.0**
Building Construction - On-Site:	2.4	21.1	1.3	1.2
Building Construction - Off-Site:	0.1	0.3	0.1	<0.1
Building Construction - Total:	**2.5**	**21.4**	**1.4**	**1.2**
Architectural Coating Application - On-Site:	3.6	1.8	0.1	0.1
Architectural Coating Application - Off-Site:	<0.1	<0.1	<0.1	<0.1
Architectural Coating Application - Total:	**3.6**	**1.8**	**0.1**	**0.1**
Paving - On-Site:	1.4	14.1	0.7	0.7
Paving - Off-Site:	0.1	0.1	0.1	<0.1
Paving - Total:	**1.5**	**14.2**	**0.8**	**0.7**
Maximum Daily Emissions:[1]	**7.6**	**63.2**	**21.7**	**12.5**
MBARD Significance Threshold[2]:	-	-	82	-
Exceeds Threshold/Significant Impact?	NA	NA	No	NA

Source: Ambient Air Quality & Noise Consulting, Air Quality & Greenhouse Gas Impact Assessment for La Tourette Subdivision Project. June 2018.
NOTES:
1. Based on highest daily emissions during demolition, site preparation, grading, and building construction under summer or winter conditions. Assumes building construction, paving, and architectural coating application, could occur simultaneously.
2. The MBARD has not identified significance thresholds for ROG, NO_X, or $PM_{2.5}$. Emissions of ROG and NO_X are accommodated in the emission inventories of State- and federally-required air plans and would not have a significant impact on the attainment and maintenance of ozone AAQS. Emissions of $PM_{2.5}$ are a component of PM_{10}.
Ambient also quantified long-term emissions using CalEEMod version 2016.3.2, assuming a total of 19 single-family residential dwelling units. Ambient derived vehicle trip-generation rates from the traffic analysis prepared for this Proposed Project. Ambient adjusted the energy intensity factors to reflect compliance with Renewable Portfolio Standards requirements. Ambient also assumed the proposed residential dwellings would include installation of solar photovoltaic systems, low-flow water fixtures, water-efficient irrigation systems, energy-efficient lighting, and appliances, in compliance with current and anticipated construction year building code requirements. At a minimum, the solar photovoltaic systems would provide 20 percent of the estimated electrical demand. Other modeling assumptions, including energy and water usage rates, waste-generation rates, vehicle trip distances, and vehicle fleet mix were based on CalEEMod model defaults for Monterey County.

Ambient determined that the Proposed Project would not result in a cumulatively considerable net increase in any criteria pollutant during operation. For the purposes of the analysis, operational impacts would be potentially significant if direct and indirect emissions would exceed: 137 lbs/day of either ROG or NOX, 550 lbs/day of Carbon Monoxide ("CO"), 82 lbs/day of PM10, or if the Project would contribute to local PM10 concentrations that exceed applicable AAQS standards. Emissions of Sulfur Dioxide ("SO2") would be significant if the Proposed Project generates direct emissions greater than 150 lbs/day. **Table 2** illustrates the operational emissions of criteria air pollutants.

Table 2
Operational Emissions of Criteria Air Pollutants

Construction Activity	ROG (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	SO_2 (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Area Sources	13.6	0.4	18.0	<0.1	2.3	2.3
Energy Use	<0.1	0.1	0.1	<0.1	<0.1	<0.1
Mobile Sources	0.5	2.2	6.2	<0.1	1.2	0.3
Maximum Daily Emissions: [5]	**14.1**	**2.8**	**24.3**	**0.1**	**3.5**	**2.7**
MBARD Significance Threshold:	**137**	**137**	**550**	**150**	**82**	**-**
Exceeds Threshold/Significant Impact?	**No**	**No**	**No**	**No**	**No**	**NA**

To be conservative, maximum daily emissions are based on the highest daily emissions for summer or winter conditions.

Based on this analysis, operational air quality emissions would be below the applicable MBARD threshold of significance. Therefore, Ambient concluded that the Proposed Project would have a less than significant impact.

GHG Emissions

Ambient similarly evaluated GHG emissions and determined that Proposed Project construction would generate a total of approximately 454.8 $MTCO_2e$. Additionally, Ambient amortized construction-generated GHGs over an estimated 30-year project life. Ambient included the amortized GHG emissions with operational emissions to evaluate potential impacts. When amortized over a 30-year life of the Proposed Project, GHG emissions would total approximately 15.2 $MTCO_2e$/year, see **Table 3** below. Construction-generated emissions would vary, depending on the final construction schedules, equipment required, and activities conducted.

Table 3
Construction Emissions of GHGs

Greenhouse Gas	Annual Emissions ($MTCO_2e$/Year)
Demolition	37.3
Site Preparation	38.9
Grading	56.1
Building Construction	284.1

Greenhouse Gas	Annual Emissions ($MTCO_2e$/Year)
Architectural Coating	17.1
Paving	21.3
Total Construction Emissions:	454.8
Amortized Net Change in Construction Emissions[1]:	15.2

Source: Ambient Air Quality & Noise Consulting. 2018.
1. Amortized emissions are quantified based on an estimated 30-year project life.
2. Refer to Appendix B for emissions modeling assumptions and results.

Ambient also calculated operational GHG emissions. With the inclusion of amortized construction-generated emissions, the buildout of the Proposed Project would generate a total of approximately 339 metric tons of carbon dioxide per year ("$MTCO_2e$/year") under year 2020 conditions and approximately 331.9 $MTCO_2e$/year under year 2030 conditions, see **Table 4** below. Mobile sources were projected to account for roughly 74-76 percent of the total operational GHG emissions at buildout. Approximately 16-17 percent of the Proposed Project's total operational GHGs would be associated with energy use, and the remaining emissions would be associated with area sources, water use, and waste generation.

Table 4
Operational Emissions of GHGs

Year	Source	Annual Emissions ($MTCO_2e$/Year)	Percent Contribution
Year 2020	Area	19.5	6.0 %
Year 2020	Energy Use	55.7	17.2 %
Year 2020	Mobile	239.5	74.0%
Year 2020	Waste	6.0	1.9 %
Year 2020	Water	3.1	1.0 %
Year 2020	Total:	323.8	
Year 2020	Total with Amortized Construction Emissions:[2]	339.0	
Year 2020	Significance Threshold:	1,100	
Year 2020	Exceeds Significance Threshold?:	No	
Year 2030	Area	19.5	6.0 %
Year 2030	Energy Use	55.7	17.2 %
Year 2030	Mobile	239.5	74.0%
Year 2030	Waste	6.0	1.9 %
Year 2030	Water	3.1	1.0 %
Year 2030	Total:	323.8	

Year	Source	Annual Emissions ($MTCO_2e$/Year)	Percent Contribution
Year 2030	Total with Amortized Construction Emissions:[2]	339.0	
Year 2030	Significance Threshold:	1,100	
Year 2030	Exceeds Significance Threshold?:	No	

Source: Ambient Air Quality & Noise Consulting. 2018
1. GHG emissions quantified for buildout conditions.
2. Refer to Appendix B for emissions modeling assumptions and results.

The MBARD Board of Directors has not yet adopted recommended GHG significance thresholds applicable to development projects. MBARD recommends use of other thresholds, such as those adopted by the Sacramento Metropolitan Air Quality Management District ("SMAQMD"). The SMAQMD GHG significance threshold applicable to development projects is 1,100 MTCO2e/year. Ambient determined that the Proposed Project would not exceed 1,100 MTCO2e/year and impacts would be less than significant.

III. Proposed Modifications

Air Quality Emissions

Since 2018, the Project Applicant made minor modifications to grading plans to accommodate the construction of the subdivision. Specifically, the Proposed Project would require 9,220 cubic yards of cut and 6,410 cubic yards of fill to accommodate proposed residences, construction of an access road, and other infrastructure. An additional 1,200 cubic yards may be required for the improvements to the external access road. There were no changes to the demolition square footage in the previous analysis. Due to the modifications to the Proposed Project, an updated CalEEMod analysis was necessary to determine whether the increase in grading would exceed applicable MBARD thresholds of significance.

Additionally, since Ambient's report was completed, MBARD adopted significance thresholds for ROG, NOx, $PM_{2.5}$, and CO for construction. Construction impacts would be potentially significant if direct and indirect emissions would exceed: 137 lbs/day of either ROG or NO_X, 55 lbs/day of $PM_{2.5}$, and 550 lbs/day of CO. MBARD also adopted $PM_{2.5}$ significance thresholds for operation and determined that impacts would be potentially significant if they exceeded 55 lbs/day of $PM_{2.5}$.

To quantify the air quality emissions, Denise Duffy & Associates ("DD&A") used CalEEMod version 2022.1.1.28 to determine the updated emissions for both construction and operation (see **Attachment A**). The updated construction generated air quality emissions are illustrated below in **Table 5 – Construction Emissions of Criteria Air Pollutants**; and the updated operational air quality emissions are included in **Table 6 – Operational Emissions of Criteria Air Pollutants.**

Table 5
Construction Emissions of Criteria Air Pollutants

Construction Activity	ROG (lbs/day)	NO_X (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)	CO (lbs/day)
Demolition - On-Site:	2.4	22.2	1.1	0.9	19.9
Demolition - Off-Site:	0.1	0.4	9.8	1.0	0.8
Demolition - Total:	2.5	22.6	10.9	1.9	20.7
Site Preparation - On-Site:	3.3	31.6	1.4	1.3	30.2
Site Preparation - Off-Site:	0.1	0.1	7.4	0.8	<0.1
Site Preparation - Total:	3.4	31.7	8.8	2.1	30.2
Grading - On-Site:	3.2	29.7	10.5	4.8	28.3
Grading - Off-Site:	0.2	4.3	48.4	5.0	2.6
Grading - Total:	3.4	34.0	58.9	9.8	30.9
Building Construction - On-Site:	1.1	10.4	0.4	0.4	13.0
Building Construction - Off-Site:	0.1	0.6	7.6	0.8	0.5
Building Construction - Total:	1.2	11.0	8.0	1.2	13.5
Architectural Coating Application - On-Site:	45.6	0.9	<0.1	<0.1	1.1
Architectural Coating Application - Off-Site:	<0.1	<0.1	0.6	0.1	<0.1
Architectural Coating Application - Total:	45.6	0.9	0.6	0.1	1.1
Paving - On-Site:	0.8	7.1	0.3	0.3	9.9
Paving - Off-Site:	0.1	0.1	6.4	0.7	0.6
Paving - Total:	0.9	7.2	6.7	1.0	10.5
Maximum Daily Emissions: [1]	45.6	34.0	58.9	9.8	30.9
MBARD Significance Threshold[2]:	137	137	82	55	550
Exceeds Threshold/Significant Impact?	No	No	No	No	No

Source: 2024 CalEEMod Updated for Air Quality & Noise Consulting, Air Quality & Greenhouse Gas Impact Assessment for La Tourette Subdivision Project. June 2018.
See Appendix A for full CalEEMod Report.
NOTES:
1. Based on highest daily emissions during demolition, site preparation, grading, and building construction under summer or winter conditions; therefore, the phased approach is used to determine highest daily emissions during construction phase Assumes building construction, paving, and architectural coating application, could occur simultaneously.
The MBARD has not identified significance thresholds for ROG, NOX, or PM2.5. Emissions of ROG and NOX are accommodated in the emission inventories of State- and federally required air plans and would not have a significant impact on the attainment and maintenance of ozone AAQS. Emissions of PM2.5 are a component of PM10.

Table 6
Operational Emissions of Criteria Air Pollutants

Operational Source	ROG (lbs/day)	NO_X (lbs/day)	CO (lbs/day)	SO_2 (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)
Area Sources	1.5	0.3	1.8	<0.1	0.1	0.1
Energy Use	<0.1	0.2	0.1	<0.1	<0.1	<0.1
Mobile Sources	0.8	1.1	7.5	<0.1	18.4	2.1
Maximum Daily Emissions: [5]	2.3	1.6	9.4	0.02	18.5	2.2
MBARD Significance Threshold:	137	137	550	150	82	55
Exceeds Threshold/Significant Impact?	No	No	No	No	No	No

See Appendix A for full CalEEMod Report.
NOTES:
1. To be conservative, maximum daily emissions are based on the highest daily emissions for summer or winter conditions.

The Proposed Project would result in a minor increase in construction emissions for ROG, PM_{10}, and $PM_{2.5}$. These increased emissions would not, however, exceed any thresholds established by MBARD. The modifications to the Proposed Project would result in increased emissions during operation for PM_{10}, but would not exceed MBARD's thresholds. Impacts would remain less than significant, consistent with the conclusions made by Ambient.

GHG Emissions

DD&A evaluated construction and operational GHG emissions for the Proposed Project due to the modifications to the grading plan. The revisions to the Proposed Project resulted in minor increases to both construction and operational GHG emissions. Specifically, construction of the Proposed Project would generate 463 $MTCO_2e$/year. Amortized over a 30-year period, construction of the Proposed Project would generate the annual emissions of 15.4 $MTCO_2e$/year. This would be a minor increase from Ambien's analysis, but below MBARD's threshold of 1,100 $MTCO_2e$/year. Operation of the Proposed Project would generate 381.2 $MTCO_2e$/year of GHG. When accounting for the amortized construction GHG emissions, the Proposed Project would generate 396.6 $MTCO_2e$/year of GHG. These construction and operational GHG emissions are well below the established SMAQMD threshold of 1,100 $MTCO_2e$/year of GHG. These updated GHG emission quantities are included below in **Table 7 – Construction Emissions of GHGs** and **Table 8 – Operational Emissions of GHGs.**

Table 7
Construction Emissions of GHGs

Construction Phase	Annual Emissions ($MTCO_2e$/Year)
Demolition (2025)	34.7
Site Preparation (2025)	24.2
Grading (2025)	91.5
Building Construction (2025/2026)	296.7
Architectural Coating (2026)	1.3
Paving (2026)	14.7

Construction Phase	Annual Emissions ($MTCO_2e$/Year)
Total Construction Emissions:	463
Amortized Net Change in Construction Emissions[1]:	15.4

Source: CalEEMod 2024, Ambient Air Quality & Noise Consulting. 2018, and Denise Duffy & Associates, Inc. 2024 CalEEMod Update. See Appendix A for full CalEEMod Report.

1. Amortized emissions are quantified based on an estimated 30-year project life.

Table 8
Operational Emissions of GHGs

Source	Annual Emissions ($MTCO_2e$/Year)	Percent Contribution
Year 2025 - Area	29.8	7.8 %
Year 2025 - Energy Use	48.6	12.8%
Year 2025 - Mobile	296	77.6%
Year 2025 - Waste	5.7	1.5%
Year 2025 - Water	1.1	0.3%
Total:	381.2	
Total with Amortized Construction Emissions:[2]	396.6	
Significance Threshold:	1,100	
Exceeds Significance Threshold?:	No	

Source: CalEEMod 2024, Ambient Air Quality & Noise Consulting. 2018, and Denise Duffy & Associates, Inc. 2024 CalEEMod Update. See Appendix A for full CalEEMod Report.

1. GHG emissions quantified for buildout conditions.

IV. Conclusion

The Proposed Project modifications would result in increases to air quality and GHG emissions. The increase in emissions during both construction and operation would not, however, exceed MBARD's thresholds of significance. Specifically, during construction, ROG would increase by 17 percent and PM_{10} emissions would increase by 36 percent. During operation, PM_{10} emissions would increase by 18 percent. While these specific AQ pollutants would increase, the updated CalEEMod analysis showed a decrease in NO_X and $PM_{2.5}$ emissions during construction and decreased ROG, NO_X, CO, SO_2, and $PM_{2.5}$ emissions during operation. These decreased AQ pollutants during construction can be attributed to more efficient heavy machinery and vehicles used during construction since the previous model was conducted. The decreases in operational emissions are a result of more efficient building standards, reduction in vehicle emissions, and more energy efficient home appliances. The increase in GHG emissions would be nominal (i.e., two percent). The increased GHG emissions during both construction and operation would be attributed to the additional earth movement to facilitate construction of the Proposed Project. Based on the updated analysis, impacts related to AQ and GHG would remain less than significant.

V. References

Ambient Air Quality & Noise Consulting. 2018. *Air Quality & Greenhouse Gas Impact Assessment for La Tourette Subdivision Project*. Dated June 2018.

Denise Duffy & Associates. 2024. *LaTourette Subdivision Detailed Report – California Emission Estimator Model Results.* Dated September 2024.

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LaTourette Subdivision Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

1.2. Land Use Types

1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

2.2. Construction Emissions by Year, Unmitigated

2.3. Construction Emissions by Year, Mitigated

2.4. Operations Emissions Compared Against Thresholds

2.5. Operations Emissions by Sector, Unmitigated

2.6. Operations Emissions by Sector, Mitigated

3. Construction Emissions Details

3.1. Demolition (2025) - Unmitigated

3.2. Demolition (2025) - Mitigated

3.3. Site Preparation (2025) - Unmitigated

3.4. Site Preparation (2025) - Mitigated

3.5. Grading (2025) - Unmitigated

3.6. Grading (2025) - Mitigated

3.7. Building Construction (2025) - Unmitigated

3.8. Building Construction (2025) - Mitigated

3.9. Building Construction (2026) - Unmitigated

3.10. Building Construction (2026) - Mitigated

3.11. Paving (2026) - Unmitigated

3.12. Paving (2026) - Mitigated

3.13. Architectural Coating (2026) - Unmitigated

3.14. Architectural Coating (2026) - Mitigated

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

4.1.2. Mitigated

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

4.2.2. Electricity Emissions By Land Use - Mitigated

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

4.2.4. Natural Gas Emissions By Land Use - Mitigated

4.3. Area Emissions by Source

4.3.1. Unmitigated

4.3.2. Mitigated

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

4.4.2. Mitigated

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

4.5.2. Mitigated

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

4.6.2. Mitigated

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

4.7.2. Mitigated

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

4.8.2. Mitigated

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

4.9.2. Mitigated

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.2.2. Mitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.3.2. Mitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.9. Operational Mobile Sources

5.9.1. Unmitigated

5.9.2. Mitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

5.10.3. Landscape Equipment

5.10.4. Landscape Equipment - Mitigated

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.11.2. Mitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

5.12.2. Mitigated

5.13. Operational Waste Generation

5.13.1. Unmitigated

5.13.2. Mitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.14.2. Mitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.15.2. Mitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

5.18.2.2. Mitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	LaTourette Subdivision
Construction Start Date	1/1/2025
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	39.2
Location	36.79876726575864, -121.63557941248288
County	Monterey
City	Unincorporated
Air District	Monterey Bay ARD
Air Basin	North Central Coast
TAZ	3233
EDFZ	6
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.28

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	19.0	Dwelling Unit	47.5	34,200	34,200	—	63.0	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Energy	E-2	Require Energy Efficient Appliances
Energy	E-10-B	Establish Onsite Renewable Energy Systems: Solar Power
Water	W-4	Require Low-Flow Water Fixtures
Water	W-5	Design Water-Efficient Landscapes

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Unmit.	1.41	1.17	10.9	13.5	0.03	8.08	1.19	2,819	0.08	2,847
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Unmit.	45.6	45.6	34.0	30.9	0.08	58.9	9.84	9,900	0.56	10,079
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—
Unmit.	2.63	2.60	10.3	11.5	0.02	7.90	1.30	2,525	0.08	2,553
Annual (Max)	—	—	—	—	—	—	—	—	—	—
Unmit.	0.48	0.48	1.88	2.09	< 0.005	1.44	0.24	418	0.01	423

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	PM10T	PM2.5T	CO2T	N2O	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—
2025	1.41	1.17	10.9	13.5	0.03	8.08	1.19	2,819	0.08	2,847
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—
2025	4.17	3.39	34.0	30.9	0.08	58.9	9.84	9,900	0.56	10,079
2026	45.6	45.6	10.4	13.4	0.03	8.03	1.14	2,808	0.08	2,835
Average Daily	—	—	—	—	—	—	—	—	—	—
2025	1.32	1.09	10.3	11.5	0.02	7.90	1.30	2,525	0.08	2,553
2026	2.63	2.60	0.99	1.35	< 0.005	0.74	0.11	244	0.01	246
Annual	—	—	—	—	—	—	—	—	—	—
2025	0.24	0.20	1.88	2.09	< 0.005	1.44	0.24	418	0.01	423
2026	0.48	0.48	0.18	0.25	< 0.005	0.14	0.02	40.5	< 0.005	40.8

2.3. Construction Emissions by Year, Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—
2025	1.41	1.17	10.9	13.5	0.03	8.08	1.19	2,819	0.08	2,847
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—
2025	4.17	3.39	34.0	30.9	0.08	58.9	9.84	9,900	0.56	10,079
2026	45.6	45.6	10.4	13.4	0.03	8.03	1.14	2,808	0.08	2,835
Average Daily	—	—	—	—	—	—	—	—	—	—
2025	1.32	1.09	10.3	11.5	0.02	7.90	1.30	2,525	0.08	2,553
2026	2.63	2.60	0.99	1.35	< 0.005	0.74	0.11	244	0.01	246
Annual	—	—	—	—	—	—	—	—	—	—
2025	0.24	0.20	1.88	2.09	< 0.005	1.44	0.24	418	0.01	423

2026	0.48	0.48	0.18	0.25	< 0.005	0.14	0.02	40.5	< 0.005	40.8

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Unmit.	2.39	2.27	1.41	9.38	0.02	18.5	2.21	2,598	0.09	2,662
Mit.	2.39	2.27	1.41	9.38	0.02	18.5	2.21	2,581	0.08	2,644
% Reduced	—	—	—	—	—	—	—	1%	2%	1%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Unmit.	2.28	2.17	1.55	8.01	0.02	18.5	2.21	2,512	0.09	2,572
Mit.	2.28	2.17	1.55	8.01	0.02	18.5	2.21	2,496	0.09	2,554
% Reduced	—	—	—	—	—	—	—	1%	2%	1%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—
Unmit.	2.15	1.94	1.30	8.90	0.02	16.4	2.06	2,253	0.09	2,318
Mit.	2.15	1.94	1.30	8.90	0.02	16.4	2.06	2,236	0.09	2,300
% Reduced	—	—	—	—	—	—	—	1%	2%	1%
Annual (Max)	—	—	—	—	—	—	—	—	—	—
Unmit.	0.39	0.35	0.24	1.62	< 0.005	2.98	0.38	373	0.01	384
Mit.	0.39	0.35	0.24	1.62	< 0.005	2.98	0.38	370	0.01	381
% Reduced	—	—	—	—	—	—	—	1%	2%	1%

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	PM10T	PM2.5T	CO2T	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Mobile	0.88	0.80	0.88	7.48	0.02	18.4	2.08	1,872	0.08	1,905
Area	1.49	1.46	0.33	1.82	< 0.005	0.11	0.11	403	< 0.005	404
Energy	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	307	< 0.005	309
Water	—	—	—	—	—	—	—	4.98	< 0.005	10.0
Waste	—	—	—	—	—	—	—	9.85	0.00	34.5
Refrig.	—	—	—	—	—	—	—	—	—	0.24
Total	2.39	2.27	1.41	9.38	0.02	18.5	2.21	2,598	0.09	2,662
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Mobile	0.87	0.79	1.04	7.19	0.02	18.4	2.08	1,790	0.09	1,817
Area	1.38	1.37	0.32	0.74	< 0.005	0.11	0.11	401	< 0.005	401
Energy	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	307	< 0.005	309
Water	—	—	—	—	—	—	—	4.98	< 0.005	10.0
Waste	—	—	—	—	—	—	—	9.85	0.00	34.5
Refrig.	—	—	—	—	—	—	—	—	—	0.24
Total	2.28	2.17	1.55	8.01	0.02	18.5	2.21	2,512	0.09	2,572
Average Daily	—	—	—	—	—	—	—	—	—	—
Mobile	0.84	0.76	0.95	6.75	0.02	16.1	1.85	1,756	0.08	1,785
Area	1.29	1.17	0.15	2.07	0.01	0.20	0.19	174	< 0.005	180
Energy	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	307	< 0.005	309
Water	—	—	—	—	—	—	—	4.98	< 0.005	10.0
Waste	—	—	—	—	—	—	—	9.85	0.00	34.5
Refrig.	—	—	—	—	—	—	—	—	—	0.24
Total	2.15	1.94	1.30	8.90	0.02	16.4	2.06	2,253	0.09	2,318
Annual	—	—	—	—	—	—	—	—	—	—
Mobile	0.15	0.14	0.17	1.23	< 0.005	2.95	0.34	291	0.01	296
Area	0.23	0.21	0.03	0.38	< 0.005	0.04	0.03	28.9	< 0.005	29.8

Energy	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	50.9	< 0.005	51.1
Water	—	—	—	—	—	—	—	0.82	< 0.005	1.66
Waste	—	—	—	—	—	—	—	1.63	0.00	5.71
Refrig.	—	—	—	—	—	—	—	—	—	0.04
Total	0.39	0.35	0.24	1.62	< 0.005	2.98	0.38	373	0.01	384

2.6. Operations Emissions by Sector, Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Mobile	0.88	0.80	0.88	7.48	0.02	18.4	2.08	1,872	0.08	1,905
Area	1.49	1.46	0.33	1.82	< 0.005	0.11	0.11	403	< 0.005	404
Energy	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	292	< 0.005	293
Water	—	—	—	—	—	—	—	3.25	< 0.005	6.62
Waste	—	—	—	—	—	—	—	9.85	0.00	34.5
Refrig.	—	—	—	—	—	—	—	—	—	0.24
Total	2.39	2.27	1.41	9.38	0.02	18.5	2.21	2,581	0.08	2,644
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Mobile	0.87	0.79	1.04	7.19	0.02	18.4	2.08	1,790	0.09	1,817
Area	1.38	1.37	0.32	0.74	< 0.005	0.11	0.11	401	< 0.005	401
Energy	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	292	< 0.005	293
Water	—	—	—	—	—	—	—	3.25	< 0.005	6.62
Waste	—	—	—	—	—	—	—	9.85	0.00	34.5
Refrig.	—	—	—	—	—	—	—	—	—	0.24
Total	2.28	2.17	1.55	8.01	0.02	18.5	2.21	2,496	0.09	2,554
Average Daily	—	—	—	—	—	—	—	—	—	—
Mobile	0.84	0.76	0.95	6.75	0.02	16.1	1.85	1,756	0.08	1,785

Area	1.29	1.17	0.15	2.07	0.01	0.20	0.19	174	< 0.005	180
Energy	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	292	< 0.005	293
Water	—	—	—	—	—	—	—	3.25	< 0.005	6.62
Waste	—	—	—	—	—	—	—	9.85	0.00	34.5
Refrig.	—	—	—	—	—	—	—	—	—	0.24
Total	2.15	1.94	1.30	8.90	0.02	16.4	2.06	2,236	0.09	2,300
Annual	—	—	—	—	—	—	—	—	—	—
Mobile	0.15	0.14	0.17	1.23	< 0.005	2.95	0.34	291	0.01	296
Area	0.23	0.21	0.03	0.38	< 0.005	0.04	0.03	28.9	< 0.005	29.8
Energy	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	48.4	< 0.005	48.6
Water	—	—	—	—	—	—	—	0.54	< 0.005	1.10
Waste	—	—	—	—	—	—	—	1.63	0.00	5.71
Refrig.	—	—	—	—	—	—	—	—	—	0.04
Total	0.39	0.35	0.24	1.62	< 0.005	2.98	0.38	370	0.01	381

3. Construction Emissions Details

3.1. Demolition (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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.86	2.40	22.2	19.9	0.03	0.92	0.84	3,425	0.03	3,437
Demolition	—	—	—	—	—	0.21	0.03	—	—	—
Onsite truck	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	0.16	0.13	1.22	1.09	< 0.005	0.05	0.05	188	< 0.005	188
Demolition	—	—	—	—	—	0.01	< 0.005	—	—	—
Onsite truck	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	0.02	0.22	0.20	< 0.005	0.01	0.01	31.1	< 0.005	31.2
Demolition	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.08	0.07	0.06	0.65	0.00	6.37	0.65	102	< 0.005	104
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	0.01	0.36	0.13	< 0.005	3.38	0.35	268	0.04	281
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.31	0.03	5.63	< 0.005	5.72
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	0.17	0.02	14.7	< 0.005	15.4
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.06	0.01	0.93	< 0.005	0.95
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.03	< 0.005	2.43	< 0.005	2.55

3.2. Demolition (2025) - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.86	2.40	22.2	19.9	0.03	0.92	0.84	3,425	0.03	3,437
Demolition	—	—	—	—	—	0.21	0.03	—	—	—
Onsite truck	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	0.16	0.13	1.22	1.09	< 0.005	0.05	0.05	188	< 0.005	188
Demolition	—	—	—	—	—	0.01	< 0.005	—	—	—
Onsite truck	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	0.02	0.22	0.20	< 0.005	0.01	0.01	31.1	< 0.005	31.2
Demolition	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.08	0.07	0.06	0.65	0.00	6.37	0.65	102	< 0.005	104
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	0.01	0.36	0.13	< 0.005	3.38	0.35	268	0.04	281
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.31	0.03	5.63	< 0.005	5.72
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	0.17	0.02	14.7	< 0.005	15.4
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.06	0.01	0.93	< 0.005	0.95
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.03	< 0.005	2.43	< 0.005	2.55

3.3. 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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	1.26	5,295	0.04	5,314
Onsite truck	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	0.11	0.09	0.87	0.83	< 0.005	0.04	0.03	145	< 0.005	146
Onsite truck	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	0.16	0.15	< 0.005	0.01	0.01	24.0	< 0.005	24.1
Onsite truck	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	0.09	0.08	0.08	0.75	0.00	7.43	0.76	119	0.01	121

Vendor	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
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.18	0.02	3.28	< 0.005	3.34
Vendor	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
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.03	< 0.005	0.54	< 0.005	0.55
Vendor	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

3.4. Site Preparation (2025) - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	1.26	5,295	0.04	5,314
Onsite truck	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	0.11	0.09	0.87	0.83	< 0.005	0.04	0.03	145	< 0.005	146
Onsite truck	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	0.16	0.15	< 0.005	0.01	0.01	24.0	< 0.005	24.1
Onsite truck	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	0.09	0.08	0.08	0.75	0.00	7.43	0.76	119	0.01	121
Vendor	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
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.18	0.02	3.28	< 0.005	3.34
Vendor	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
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.03	< 0.005	0.54	< 0.005	0.55
Vendor	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

3.5. 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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	1.14	6,599	0.05	6,622
Dust From Material Movement	—	—	—	—	—	9.23	3.66	—	—	—
Onsite truck	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	0.21	0.18	1.63	1.55	< 0.005	0.07	0.06	362	< 0.005	363
Dust From Material Movement	—	—	—	—	—	0.51	0.20	—	—	—
Onsite truck	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	0.03	0.30	0.28	< 0.005	0.01	0.01	59.9	< 0.005	60.1
Dust From Material Movement	—	—	—	—	—	0.09	0.04	—	—	—
Onsite truck	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	0.10	0.09	0.09	0.86	0.00	8.49	0.86	136	0.01	138
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.26	0.07	4.25	1.53	0.02	39.9	4.18	3,165	0.50	3,319
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.04	0.00	0.42	0.04	7.50	< 0.005	7.63
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.23	0.08	< 0.005	1.96	0.21	173	0.03	182
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.08	0.01	1.24	< 0.005	1.26
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.04	0.02	< 0.005	0.36	0.04	28.7	< 0.005	30.1

3.6. Grading (2025) - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	1.14	6,599	0.05	6,622
Dust From Material Movement	—	—	—	—	—	9.23	3.66	—	—	—
Onsite truck	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	0.21	0.18	1.63	1.55	< 0.005	0.07	0.06	362	< 0.005	363
Dust From Material Movement	—	—	—	—	—	0.51	0.20	—	—	—
Onsite truck	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	0.03	0.30	0.28	< 0.005	0.01	0.01	59.9	< 0.005	60.1
Dust From Material Movement	—	—	—	—	—	0.09	0.04	—	—	—
Onsite truck	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	0.10	0.09	0.09	0.86	0.00	8.49	0.86	136	0.01	138
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.26	0.07	4.25	1.53	0.02	39.9	4.18	3,165	0.50	3,319
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	< 0.005	0.04	0.00	0.42	0.04	7.50	< 0.005	7.63
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.23	0.08	< 0.005	1.96	0.21	173	0.03	182
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.08	0.01	1.24	< 0.005	1.26
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.04	0.02	< 0.005	0.36	0.04	28.7	< 0.005	30.1

3.7. 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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	0.40	2,398	0.02	2,406
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	1.35	1.13	10.4	13.0	0.02	0.43	0.40	2,398	0.02	2,406
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—

Onsite truck	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	0.78	0.65	6.03	7.53	0.01	0.25	0.23	1,384	0.01	1,389
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.12	1.10	1.37	< 0.005	0.05	0.04	229	< 0.005	230
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.03	0.03	0.02	0.31	0.00	2.90	0.30	49.4	< 0.005	50.3
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	0.55	0.06	40.0	0.01	41.9
Hauling	0.03	0.01	0.42	0.16	< 0.005	4.19	0.44	332	0.05	349
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.29	0.00	2.90	0.30	46.6	< 0.005	47.3
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	0.55	0.06	40.1	0.01	41.8
Hauling	0.03	0.01	0.45	0.16	< 0.005	4.19	0.44	332	0.05	349
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.16	0.00	1.50	0.15	27.0	< 0.005	27.5
Vendor	< 0.005	< 0.005	0.03	0.02	< 0.005	0.28	0.03	23.1	< 0.005	24.2
Hauling	0.02	< 0.005	0.25	0.09	< 0.005	2.17	0.23	192	0.03	201
Annual	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.27	0.03	4.48	< 0.005	4.55
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	0.05	0.01	3.83	< 0.005	4.00
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	0.40	0.04	31.8	0.01	33.3

3.8. Building Construction (2025) - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	0.40	2,398	0.02	2,406
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	1.35	1.13	10.4	13.0	0.02	0.43	0.40	2,398	0.02	2,406
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.78	0.65	6.03	7.53	0.01	0.25	0.23	1,384	0.01	1,389
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.14	0.12	1.10	1.37	< 0.005	0.05	0.04	229	< 0.005	230
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.03	0.03	0.02	0.31	0.00	2.90	0.30	49.4	< 0.005	50.3
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	0.55	0.06	40.0	0.01	41.9
Hauling	0.03	0.01	0.42	0.16	< 0.005	4.19	0.44	332	0.05	349
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.29	0.00	2.90	0.30	46.6	< 0.005	47.3
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	0.55	0.06	40.1	0.01	41.8
Hauling	0.03	0.01	0.45	0.16	< 0.005	4.19	0.44	332	0.05	349
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.16	0.00	1.50	0.15	27.0	< 0.005	27.5
Vendor	< 0.005	< 0.005	0.03	0.02	< 0.005	0.28	0.03	23.1	< 0.005	24.2
Hauling	0.02	< 0.005	0.25	0.09	< 0.005	2.17	0.23	192	0.03	201
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.27	0.03	4.48	< 0.005	4.55
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	0.05	0.01	3.83	< 0.005	4.00
Hauling	< 0.005	< 0.005	0.05	0.02	< 0.005	0.40	0.04	31.8	0.01	33.3

3.9. 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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	0.35	2,397	0.02	2,405
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.07	0.06	0.52	0.69	< 0.005	0.02	0.02	127	< 0.005	127
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.10	0.13	< 0.005	< 0.005	< 0.005	21.0	< 0.005	21.0
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.03	0.03	0.03	0.27	0.00	2.90	0.30	45.7	< 0.005	46.4
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	0.55	0.06	39.3	0.01	41.1
Hauling	0.03	0.01	0.43	0.15	< 0.005	4.19	0.44	326	0.05	342
Average Daily	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.14	0.01	2.43	< 0.005	2.47
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.03	< 0.005	2.08	< 0.005	2.17
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	0.20	0.02	17.2	< 0.005	18.1
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.03	< 0.005	0.40	< 0.005	0.41
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.34	< 0.005	0.36
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.04	< 0.005	2.85	< 0.005	2.99

3.10. Building Construction (2026) - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	0.35	2,397	0.02	2,405
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.07	0.06	0.52	0.69	< 0.005	0.02	0.02	127	< 0.005	127
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.10	0.13	< 0.005	< 0.005	< 0.005	21.0	< 0.005	21.0
Dust From Material Movement	—	—	—	—	—	< 0.005	< 0.005	—	—	—
Onsite truck	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	0.03	0.03	0.03	0.27	0.00	2.90	0.30	45.7	< 0.005	46.4
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	0.55	0.06	39.3	0.01	41.1
Hauling	0.03	0.01	0.43	0.15	< 0.005	4.19	0.44	326	0.05	342
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.14	0.01	2.43	< 0.005	2.47
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.03	< 0.005	2.08	< 0.005	2.17
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	0.20	0.02	17.2	< 0.005	18.1
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.03	< 0.005	0.40	< 0.005	0.41
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.34	< 0.005	0.36
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.04	< 0.005	2.85	< 0.005	2.99

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.91	0.76	7.12	9.94	0.01	0.32	0.29	1,511	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
Average Daily	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.39	0.54	< 0.005	0.02	0.02	82.8	< 0.005	83.1
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
Annual	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.10	< 0.005	< 0.005	< 0.005	13.7	< 0.005	13.8
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
Offsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.06	0.60	0.00	6.37	0.65	100	< 0.005	102
Vendor	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
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.31	0.03	5.52	< 0.005	5.61
Vendor	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
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.06	0.01	0.91	< 0.005	0.93
Vendor	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

3.12. Paving (2026) - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.76	7.12	9.94	0.01	0.32	0.29	1,511	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
Average Daily	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.39	0.54	< 0.005	0.02	0.02	82.8	< 0.005	83.1
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
Annual	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.10	< 0.005	< 0.005	< 0.005	13.7	< 0.005	13.8
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
Offsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.06	0.60	0.00	6.37	0.65	100	< 0.005	102
Vendor	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

Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.31	0.03	5.52	< 0.005	5.61
Vendor	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
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.06	0.01	0.91	< 0.005	0.93
Vendor	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

3.13. 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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	0.02	134	< 0.005	134
Architectural Coatings	45.5	45.5	—	—	—	—	—	—	—	—
Onsite truck	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	0.01	0.01	0.05	0.06	< 0.005	< 0.005	< 0.005	7.32	< 0.005	7.34
Architectural Coatings	2.49	2.49	—	—	—	—	—	—	—	—
Onsite truck	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	0.01	0.01	< 0.005	< 0.005	< 0.005	1.21	< 0.005	1.22

Architectural Coatings	0.45	0.45	—	—	—	—	—	—	—	—
Onsite truck	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	0.01	0.01	0.01	0.05	0.00	0.58	0.06	9.15	< 0.005	9.28
Vendor	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
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.03	< 0.005	0.50	< 0.005	0.51
Vendor	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
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.01	< 0.005	0.08	< 0.005	0.08
Vendor	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

3.14. Architectural Coating (2026) - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	0.02	134	< 0.005	134

Architectural Coatings	45.5	45.5	—	—	—	—	—	—	—	—
Onsite truck	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	0.01	0.01	0.05	0.06	< 0.005	< 0.005	< 0.005	7.32	< 0.005	7.34
Architectural Coatings	2.49	2.49	—	—	—	—	—	—	—	—
Onsite truck	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	0.01	0.01	< 0.005	< 0.005	< 0.005	1.21	< 0.005	1.22
Architectural Coatings	0.45	0.45	—	—	—	—	—	—	—	—
Onsite truck	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	0.01	0.01	0.01	0.05	0.00	0.58	0.06	9.15	< 0.005	9.28
Vendor	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
Average Daily	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.03	< 0.005	0.50	< 0.005	0.51
Vendor	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
Annual	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.01	< 0.005	0.08	< 0.005	0.08
Vendor	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

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.88	0.80	0.88	7.48	0.02	18.4	2.08	1,872	0.08	1,905
Total	0.88	0.80	0.88	7.48	0.02	18.4	2.08	1,872	0.08	1,905
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.87	0.79	1.04	7.19	0.02	18.4	2.08	1,790	0.09	1,817
Total	0.87	0.79	1.04	7.19	0.02	18.4	2.08	1,790	0.09	1,817
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.15	0.14	0.17	1.23	< 0.005	2.95	0.34	291	0.01	296
Total	0.15	0.14	0.17	1.23	< 0.005	2.95	0.34	291	0.01	296

4.1.2. Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.88	0.80	0.88	7.48	0.02	18.4	2.08	1,872	0.08	1,905
Total	0.88	0.80	0.88	7.48	0.02	18.4	2.08	1,872	0.08	1,905

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.87	0.79	1.04	7.19	0.02	18.4	2.08	1,790	0.09	1,817
Total	0.87	0.79	1.04	7.19	0.02	18.4	2.08	1,790	0.09	1,817
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.15	0.14	0.17	1.23	< 0.005	2.95	0.34	291	0.01	296
Total	0.15	0.14	0.17	1.23	< 0.005	2.95	0.34	291	0.01	296

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	64.4	< 0.005	65.0
Total	—	—	—	—	—	—	—	64.4	< 0.005	65.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	64.4	< 0.005	65.0
Total	—	—	—	—	—	—	—	64.4	< 0.005	65.0
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	10.7	< 0.005	10.8
Total	—	—	—	—	—	—	—	10.7	< 0.005	10.8

4.2.2. Electricity Emissions By Land Use - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	49.4	< 0.005	49.8
Total	—	—	—	—	—	—	—	49.4	< 0.005	49.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	49.4	< 0.005	49.8
Total	—	—	—	—	—	—	—	49.4	< 0.005	49.8
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	8.17	< 0.005	8.25
Total	—	—	—	—	—	—	—	8.17	< 0.005	8.25

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	243	< 0.005	244
Total	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	243	< 0.005	244
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	243	< 0.005	244
Total	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	243	< 0.005	244
Annual	—	—	—	—	—	—	—	—	—	—

Single Family Housing	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	40.2	< 0.005	40.3
Total	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	40.2	< 0.005	40.3

4.2.4. Natural Gas Emissions By Land Use - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	243	< 0.005	244
Total	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	243	< 0.005	244
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	243	< 0.005	244
Total	0.02	0.01	0.19	0.08	< 0.005	0.02	0.02	243	< 0.005	244
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	40.2	< 0.005	40.3
Total	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	< 0.005	40.2	< 0.005	40.3

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Hearths	0.58	0.56	0.32	0.74	< 0.005	0.11	0.11	401	< 0.005	401

Consumer Products	0.73	0.73	—	—	—	—	—	—	—	—
Architectural Coatings	0.07	0.07	—	—	—	—	—	—	—	—
Landscape Equipment	0.10	0.10	0.01	1.08	< 0.005	< 0.005	< 0.005	2.88	< 0.005	2.89
Total	1.49	1.46	0.33	1.82	< 0.005	0.11	0.11	403	< 0.005	404
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Hearths	0.58	0.56	0.32	0.74	< 0.005	0.11	0.11	401	< 0.005	401
Consumer Products	0.73	0.73	—	—	—	—	—	—	—	—
Architectural Coatings	0.07	0.07	—	—	—	—	—	—	—	—
Total	1.38	1.37	0.32	0.74	< 0.005	0.11	0.11	401	< 0.005	401
Annual	—	—	—	—	—	—	—	—	—	—
Hearths	0.08	0.05	0.03	0.24	< 0.005	0.04	0.03	28.6	< 0.005	29.4
Consumer Products	0.13	0.13	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	0.01	—	—	—	—	—	—	—	—
Landscape Equipment	0.01	0.01	< 0.005	0.13	< 0.005	< 0.005	< 0.005	0.33	< 0.005	0.33
Total	0.23	0.21	0.03	0.38	< 0.005	0.04	0.03	28.9	< 0.005	29.8

4.3.2. Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Hearths	0.58	0.56	0.32	0.74	< 0.005	0.11	0.11	401	< 0.005	401

Consumer Products	0.73	0.73	—	—	—	—	—	—	—	—
Architectural Coatings	0.07	0.07	—	—	—	—	—	—	—	—
Landscape Equipment	0.10	0.10	0.01	1.08	< 0.005	< 0.005	< 0.005	2.88	< 0.005	2.89
Total	1.49	1.46	0.33	1.82	< 0.005	0.11	0.11	403	< 0.005	404
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Hearths	0.58	0.56	0.32	0.74	< 0.005	0.11	0.11	401	< 0.005	401
Consumer Products	0.73	0.73	—	—	—	—	—	—	—	—
Architectural Coatings	0.07	0.07	—	—	—	—	—	—	—	—
Total	1.38	1.37	0.32	0.74	< 0.005	0.11	0.11	401	< 0.005	401
Annual	—	—	—	—	—	—	—	—	—	—
Hearths	0.08	0.05	0.03	0.24	< 0.005	0.04	0.03	28.6	< 0.005	29.4
Consumer Products	0.13	0.13	—	—	—	—	—	—	—	—
Architectural Coatings	0.01	0.01	—	—	—	—	—	—	—	—
Landscape Equipment	0.01	0.01	< 0.005	0.13	< 0.005	< 0.005	< 0.005	0.33	< 0.005	0.33
Total	0.23	0.21	0.03	0.38	< 0.005	0.04	0.03	28.9	< 0.005	29.8

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	4.98	< 0.005	10.0
Total	—	—	—	—	—	—	—	4.98	< 0.005	10.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	4.98	< 0.005	10.0
Total	—	—	—	—	—	—	—	4.98	< 0.005	10.0
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	0.82	< 0.005	1.66
Total	—	—	—	—	—	—	—	0.82	< 0.005	1.66

4.4.2. Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	3.25	< 0.005	6.62
Total	—	—	—	—	—	—	—	3.25	< 0.005	6.62
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	3.25	< 0.005	6.62
Total	—	—	—	—	—	—	—	3.25	< 0.005	6.62
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	0.54	< 0.005	1.10
Total	—	—	—	—	—	—	—	0.54	< 0.005	1.10

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	9.85	0.00	34.5
Total	—	—	—	—	—	—	—	9.85	0.00	34.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	9.85	0.00	34.5
Total	—	—	—	—	—	—	—	9.85	0.00	34.5
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	1.63	0.00	5.71
Total	—	—	—	—	—	—	—	1.63	0.00	5.71

4.5.2. Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	9.85	0.00	34.5
Total	—	—	—	—	—	—	—	9.85	0.00	34.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	9.85	0.00	34.5
Total	—	—	—	—	—	—	—	9.85	0.00	34.5
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	1.63	0.00	5.71
Total	—	—	—	—	—	—	—	1.63	0.00	5.71

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.24
Total	—	—	—	—	—	—	—	—	—	0.24
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.24
Total	—	—	—	—	—	—	—	—	—	0.24
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.04
Total	—	—	—	—	—	—	—	—	—	0.04

4.6.2. Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.24
Total	—	—	—	—	—	—	—	—	—	0.24
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.24
Total	—	—	—	—	—	—	—	—	—	0.24
Annual	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.04
Total	—	—	—	—	—	—	—	—	—	0.04

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

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	PM10T	PM2.5T	CO2T	N2O	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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

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	PM10T	PM2.5T	CO2T	N2O	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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

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	PM10T	PM2.5T	CO2T	N2O	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	PM10T	PM2.5T	CO2T	N2O	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	PM10T	PM2.5T	CO2T	N2O	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	PM10T	PM2.5T	CO2T	N2O	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	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

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	PM10T	PM2.5T	CO2T	N2O	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
Demolition	Demolition	1/1/2025	1/28/2025	5.00	20.0	—
Site Preparation	Site Preparation	1/29/2025	2/11/2025	5.00	10.0	—
Grading	Grading	2/12/2025	3/11/2025	5.00	20.0	—
Building Construction	Building Construction	3/12/2025	1/27/2026	5.00	230	—
Paving	Paving	1/28/2026	2/24/2026	5.00	20.0	—
Architectural Coating	Architectural Coating	2/25/2026	3/24/2026	5.00	20.0	—

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
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
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	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
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	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45

Building Construction	Tractors/Loaders/Back	Diesel	Average	3.00	7.00	84.0	0.37
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

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
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	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
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	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
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	9.47	LDA,LDT1,LDT2
Site Preparation	Vendor	—	6.03	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	9.47	LDA,LDT1,LDT2
Grading	Vendor	—	6.03	HHDT,MHDT
Grading	Hauling	44.3	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	6.84	9.47	LDA,LDT1,LDT2
Building Construction	Vendor	2.03	6.03	HHDT,MHDT
Building Construction	Hauling	4.65	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	9.47	LDA,LDT1,LDT2
Paving	Vendor	—	6.03	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—

Architectural Coating	Worker	1.37	9.47	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	6.03	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT
Demolition	—	—	—	—
Demolition	Worker	15.0	9.47	LDA,LDT1,LDT2
Demolition	Vendor	—	6.03	HHDT,MHDT
Demolition	Hauling	3.75	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	9.47	LDA,LDT1,LDT2
Site Preparation	Vendor	—	6.03	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	9.47	LDA,LDT1,LDT2
Grading	Vendor	—	6.03	HHDT,MHDT
Grading	Hauling	44.3	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	6.84	9.47	LDA,LDT1,LDT2
Building Construction	Vendor	2.03	6.03	HHDT,MHDT
Building Construction	Hauling	4.65	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—

Paving	Worker	15.0	9.47	LDA,LDT1,LDT2
Paving	Vendor	—	6.03	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	1.37	9.47	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	6.03	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT
Demolition	—	—	—	—
Demolition	Worker	15.0	9.47	LDA,LDT1,LDT2
Demolition	Vendor	—	6.03	HHDT,MHDT
Demolition	Hauling	3.75	20.0	HHDT
Demolition	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	69,255	23,085	0.00	0.00	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	6,500	—
Grading	3,520	3,560	60.0	0.00	—
Building Construction	5,700	2,850	46.0	0.00	—
Paving	0.00	0.00	0.00	0.00	0.21

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	0.21	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	179	181	162	64,684	2,228	2,252	2,018	803,580

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	179	181	162	64,684	2,228	2,252	2,018	803,580

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	1
Gas Fireplaces	17
Propane Fireplaces	1
Electric Fireplaces	0
No Fireplaces	0
Conventional Wood Stoves	0
Catalytic Wood Stoves	1
Non-Catalytic Wood Stoves	1
Pellet Wood Stoves	1

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	1
Gas Fireplaces	17
Propane Fireplaces	1

Electric Fireplaces	0
No Fireplaces	0
Conventional Wood Stoves	0
Catalytic Wood Stoves	1
Non-Catalytic Wood Stoves	1
Pellet Wood Stoves	1

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)
69255	23,085	0.00	0.00	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

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	115,204	204	0.0330	0.0040	758,102

5.11.2. Mitigated

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	88,318	204	0.0330	0.0040	758,102

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	794,335	489,163

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	530,060	292,904

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	18.3	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	18.3	—

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

5.14.2. Mitigated

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

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

5.15.2. Mitigated

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

5.18.1.2. Mitigated

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

5.18.1.2. Mitigated

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)

5.18.2.2. Mitigated

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	7.28	annual days of extreme heat
Extreme Precipitation	4.05	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	32.3	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	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	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	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	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 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	14.9
AQ-PM	1.63
AQ-DPM	15.0
Drinking Water	96.4
Lead Risk Housing	27.0
Pesticides	97.3
Toxic Releases	7.75
Traffic	69.2
Effect Indicators	—
CleanUp Sites	68.9
Groundwater	22.1
Haz Waste Facilities/Generators	35.6
Impaired Water Bodies	77.3
Solid Waste	87.7
Sensitive Population	—
Asthma	56.4
Cardio-vascular	27.4
Low Birth Weights	27.6
Socioeconomic Factor Indicators	—
Education	54.6
Housing	31.2
Linguistic	54.6
Poverty	40.3
Unemployment	28.2

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	60.7596561
Employed	18.74759399
Median HI	62.24817144
Education	—
Bachelor's or higher	39.34300013
High school enrollment	25.31759271
Preschool enrollment	69.84473245
Transportation	—
Auto Access	98.98626973
Active commuting	24.61183113
Social	—
2-parent households	81.93250353
Voting	65.73848325
Neighborhood	—
Alcohol availability	83.52367509
Park access	5.363788015
Retail density	8.597459258
Supermarket access	21.04452714
Tree canopy	94.17425895
Housing	—
Homeownership	83.7931477
Housing habitability	94.84152445
Low-inc homeowner severe housing cost burden	83.92146798
Low-inc renter severe housing cost burden	90.2219941

Uncrowded housing	66.03361992
Health Outcomes	—
Insured adults	36.09649686
Arthritis	0.0
Asthma ER Admissions	42.4
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	22.8
Cognitively Disabled	74.6
Physically Disabled	65.4
Heart Attack ER Admissions	65.0
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	73.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.2
SLR Inundation Area	81.9

Children	76.4
Elderly	25.4
English Speaking	36.4
Foreign-born	47.7
Outdoor Workers	15.4
Climate Change Adaptive Capacity	—
Impervious Surface Cover	94.3
Traffic Density	42.6
Traffic Access	0.0
Other Indices	—
Hardship	52.2
Other Decision Support	—
2016 Voting	64.4

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	45.0
Healthy Places Index Score for Project Location (b)	58.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
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	19 SFR, 47.5 ac., 34,200 sf.
Construction: Construction Phases	Based on model defaults. 20 days demo, 10 days site prep, 20 days grading, 230 days construction, 20 days paving. Arch coating distributed over building phase excluding initial 5-month development period.
Construction: Dust From Material Movement	Information provided by C3 Engineering from the Preliminary Subdivision Grading Plan assumes 3,520 cy import/3,560 export for site development plus an additional 300 cy import and 150 cy export for each lot (19 lots) = 5,700 cy imported/2,850 cy exported. Total 9,220 cy import and 6,410 cy export.
Operations: Road Dust	Majority of roads will be paved during construction.
Construction: On-Road Fugitive Dust	Vast majority of roads in the area are paved.

Appendix C

Association of Monterey Bay Area Governments Consistency Letter

AMBAG
ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS

December 19, 2006

Alison Imamura, AICP
Denise Duffy & Associates, Inc.
947 Cass Street, Suite 5
Monterey, CA 93940

Dear Ms. Imamura:

This letter is in response to your December 1, 2006 request for a determination of consistency of the LaTourette Subdivision Project with the *Air Quality Management Plan for the Monterey Bay Region* (AQMP).

Consistency of housing projects with the AQMP is analyzed by comparing the total potential population growth facilitated by the project with the forecasted growth for Monterey County. The *2004 Population, Housing Unit, and Employment Forecasts* adopted by the AMBAG Board of Directors on April 14, 2004 are the forecasts used for this consistency determination.

AMBAG staff surveyed each jurisdiction in Monterey County to determine the number of housing units that jurisdictions have approved but have not yet received a building permit. The total number of units is 8,395. Building permit data was also collected. A total of 624 housing units have received building permits between January and November 2006. The California Department of Finance estimates there are 138,617 dwelling units in Monterey County as of 1/01/06. Combined, there are 147,636 existing, approved, and or permitted housing units in Monterey County.

The LaTourette Subdivision Project consists of a total of 19 residential units. Occupancy of the housing units is estimated to take place by 2010. The *2004 Population, Housing Unit, and Employment Forecast* forecasts there will be 151,844 housing units in Monterey County by the year 2010.

The combination of the existing and approved housing units in Monterey County (147,655) plus the 19 housing units in the LaTourette Subdivision Project is less then the regional forecasts for Monterey County (151,844.) Therefore the LaTourette Subdivision Project is **consistent** with the 2004 regional forecasts and the Air Quality Management Plan.

Please feel free to contact me if you have any questions about this determination.

Sincerely,

Todd Muck, AICP
Senior Planner

cc: Jean Getchell, MBUAPCD

Appendix D

Staub Forest Management Plan

Staub Forestry &
Environmental Consulting

FOREST MANAGEMENT PLAN

for

Monterey County APN 125-101-016

Prepared For

Jeffery and Monica La Tourette

Prepared by

Staub Forestry and Environmental Consulting

Stephen R. Staub
Registered Professional Forester
License #1911

Bill Ruskin
Registered Professional Forester
License #2248

October 2006

6010 Highway 9, Suite 6 Felton CA 95018 Phone 831. 335.1452 Fax 831. 335.1462 staubtre@pacbell.net
Stephen R. Staub, Registered Professional Forester License No. 1911
Cassady Bill Vaughan, Registered Professional Forester License No. 2685
Cheyenne Borello, Registered Professional Forester License No. 2784

FOREST MANAGEMENT PLAN

for

Hidden Forest Subdivision, Monterey County

APN 125-101-016

Owner/Applicant: Jeffrey and Monica La Tourette
8754 Woodland Heights Place
Prunedale, CA 93907

Introduction

This Forest Management Plan is prepared for Jeffrey and Monica La Tourette by Stephen R. Staub, Registered Professional Forester #1911 and Bill Ruskin, Registered Professional Forester #2248. It is to be made a part of an application for a 19-lot residential subdivision of this approximately 47.8 acre property, which is located about 3 miles southeast of the town of Prunedale. The Forest Management Plan is subject to the requirements of Zoning Ordinance #21.64.260, which applies restrictions for the preservation of oak and other protected trees as required in the Monterey County General Plan, area plans, and master plans. The scope of this plan covers the trees on the entire property with particular emphasis on trees that will be impacted by construction of road and common driveway infrastructure. Initial site review was done in 2004 and 2005 with final fieldwork and data collection completed on September 18th and 25th, 2006.

Site Description

Assessor's Parcel Number: 125-101-016 to be subdivided as delineated on the Vesting Tentative Map (dated May 25, 2006) prepared by Monterey County Surveyors, Inc.

Location: Approximately 3 miles southeast of the town of Prunedale. Primary access will be east of Highway 101 from Pesante Road to North King Road.

Parcel Size:
APN 125-101-016 = approximately 47.8 acres.

Existing Land Use: Rural residential (2 existing residences), past history of farming and greenhouse agriculture.

Slope: Slopes within proposed residential lots are generally less than 30%, sometimes exceeding 30% outside building envelopes. The parcel contains both gentle to moderate swale/valley bottoms and ridgetops and moderate to somewhat steeper sidehills

Soils: Soils on the property are loamy sands that formed on hills and uplands in old marine sand dunes or in materials weathered from soft sandstone. The Soil Survey of Monterey County, California (USDA, 1978.) shows predominantly Arnold series loamy sands with inclusions of other soils such as Oceano loamy sands and Santa Ynez and Elkhorn fine sandy loams. Surface layers tend to be grayish brown to dark brown with variable depths and concentrations of clay in the subsoil.

Vegetation: Parcel vegetation is a mix of disturbed annual grassland, coast live oak woodland mixed with planted trees, and maritime chaparral. Oak woodland is concentrated in lower areas and on east facing side slopes. Maritime chaparral occurs in more upland and ridgetop areas on the site where soils are shallower and may have some clay restrictions in the subsoil. Habitat mapping by Denise Duffy and Associates estimates annual grassland at just over 19 acres, oak woodland at nearly 17 acres and maritime chaparral at more than 11 acres. See the Biological Assessment of the project prepared by Denise Duffy Associates for a more complete description of parcel vegetation.

There is an obvious history of introduction of numerous exotic tree species and as well as regionally common trees which are not native to this site. The most prominent non-native trees on the property are Monterey pines (*Pinus radiata*), Eucalyptus (*Eucalyptus spp.)* and Coast Redwood (*Sequoia sempervirens*). Monterey Pine dominates portions of parcels 1, 5, 6, 16, 18, and 19. Eucalyptus dominates portions of parcels 11, 13, 15, 16, 17, and 18. Coast redwoods appear to have been planted on parcels 1, 6, and 11, and have survived in small clumps. Monterey pine has also been planted as a boundary fence along the eastern property boundary and short portion of the western property boundary. The planted pine trees appear to be on the order of 40 years old and are nearing the end of their expected life. There are numerous seedlings propagating both of Monterey Pine and Eucalyptus.

Vegetation on most of the property has been significantly influenced by past and current agricultural and ranching activities, including the planting of trees not native to the site. There remain numerous fruit bearing and landscape trees around the home sites. A large clearing project was conducted in recent years on portions of parcels 1, 3, 4, 5, 6, 7, 8, 9, and 10, which was intended to facilitate an organic farming lease, which never came to fruition. Vegetation in this area is now best characterized as disturbed annual grassland with some occupation of invasive exotics (pampas grass).

Forest Condition and Health: As indicated above, the roughly 17 acres of forest cover on the property has been greatly influenced by past management activities. There remains a large stand of coast live oak forest within parcels 1, 3, 4, 5, and 7, which reflects the capability of the property to support a fairly dense and vigorous native tree canopy. Clearly a significant native cover type here, the stand supports a few rather large specimens at the bottom of the drainage with generally smaller, often younger trees occurring on the sideslopes. Similar conditions occur

within portions of parcels 2, 11, and 19 as well. Oak foliage generally has good color and density indicating reasonable overall health. Oaks on the property are generally thriving where not dominated by non-native trees. The presence of internal decay and cavities was noted from time to time and represents a useful niche habitat that is likely to increase as the forest matures. Native oak pathogens appear to be present at more or less normal background levels.

The overly dense and non-native plantings throughout the eastern area of the property are problematic. The planted Monterey Pines are quickly approaching the end of their life expectancy, and due to the dryness of the site, are now susceptible to insect attack and other diseases (including pitch canker). Advancing mortality of these trees is evident, and due to their size, has become and will continue to be a failure hazard for current residents and visitors. At least five or six larger Monterey pines have failed in the last few years, two of which damaged improvements and vehicles. Some of the older dead trees appear to support active wildlife use as long as the snag is standing. The dryness of the site reduces decomposition which has resulted in an ominous buildup of dry fuel on the forest floor beneath these trees. This is particularly evident beneath the stands of bluegum eucalyptus (*Eucalyptus globulus*). Ongoing regeneration of both these non-native tree species here will pose a management problem into the future.

Project Description

The project proposes subdivision of the parcel into 19 residential lots, with a minimum lot size of just over 1 acre and a maximum lot size of more than 8 acres. Building and septic envelopes have been designated for each parcel as well as a number of areas that are to remain undisturbed. Existing dirt roads will be realigned in some areas and widened and paved to provide appropriate residential access. Primary access is proposed over roads and an existing easement through the adjoining Woodland Heights subdivision. Existing direct access to the property over North King Road is proposed for use as secondary and emergency access only. Potential tree impacts of widening the North King Road route for principal residential access were also analyzed as part of project review.

Potential home sites within each lot will be located on gentle to moderate terrain. The home sites and septic locations have been situated to avoid tree loss in construction, favoring previously cleared areas. Should subsequent owners plan to move either the building site or the septic location, any additional tree loss other than what is anticipated here would be subject to the permitting process for that individual project. Percolation tests on proposed septic areas have been completed. Building sites on three parcels make use of pre-existing building areas.

Estimated Native Oak Population

To characterize stand structure and tree numbers, random tree density measurements by diameter class on five, tenth acre plots were taken across the range of oak woodland cover types. These three general types consist of: 1) larger diameter oaks, with fewer trees located in lower flat lands. 2) Medium diameter oaks, with higher densities of trees located in flats and moderate slopes, and 3) smaller diameter trees, with higher densities located on ridges. Following the acreage of mixed oak woodland mapped by Denise Duffy and Associates, confirmed by field

reconnaissance and USGS 1998 aerial photography, we applied the results of our sampling to 17 acres to estimate the total population of native oaks on the parcel. A significant number of the oak trees have multiple trunks so actual stem density is greater than the number of reported trees. While only a small percentage of the total number of trees was actually measured, the sampling is adequate for purposes of general description and scoping of potential project impacts.

Planted trees occur in concentrated areas and so are not well estimated by systematic random sampling. Therefore a tally of all non-native trees (except ornamentals and those planted on the eastern and southern boundaries) was made throughout the project area to characterize the presence and occupancy of the site by non-native trees that have been planted or seeded in from planted trees. The numerous planted, non-native trees along the eastern property boundary are not included in these numbers as they are not impacted by the proposed project.

Based on the combination of sampling and tallies, Table 1 estimates the tree population on the property by species and diameter class.

Table 1: Estimated Native*/Non-Native Tree Population			
Diameter class	6-11"	12-23"	23+"
Coast Live Oak	1142	534	32
Monterey Pine	69	98	79
Eucalyptus	18	34	12
Coast Redwood	9	13	0

*Coast live oak is the only species listed in the table that is native to the project site.

Estimated Tree Removal for the Project

Estimates of tree removals necessary to complete the project were made separately for proposed roads and for residential construction on individual lots. To estimate tree removals necessary to construct the proposed primary access roads, Monterey County Surveyors, Inc. performed several separate tree surveys in order to cover trees potentially affected over both the proposed route through Woodland Heights with emergency access only out the North King Road extension and for an alternate route using the North King Road extension as the primary access with emergency access only through Woodland Heights. In March of 2005 a survey was conducted to inventory removal trees for primary access along the North King road extension for the first 1,600' south of the property boundary to a point where access for a four lot subdivision is under consideration. Tree locations along proposed roads for both alternatives within the development were surveyed in 2006. In September 2006, we tallied tree removals necessary to use the North King Road extension as a primary access from 1600' south of the property to its junction with the paved road below the Woodland Heights subdivision gate to complete estimation of tree removal for this alternative. Tree removals for roads and associated infrastructure were estimated by tallying individual trees too close to proposed construction to be retained as shown on current project maps prepared by Monterey County Surveyors. Tree mapping and appropriateness of removal were reviewed in the field with effective staking in place.

A comparison of tree removal associated with the two different primary access alternatives is given in Table 2.

Table 2: Estimated Tree Removals for Two Primary Access Alternatives

Primary Access Route	Oaks				Pines				TOTAL
	6-11"	12-23"	24"+	Sum	6-11"	12-23"	24"+	Sum	
Woodland Heights	8	1	0	9	1	0	18	19	**28**
North King Road	73	33	2	108	0	11	30	41	**149**

Significantly more tree removal is required on the North King Road option primarily because the existing road must be expanded to at least a 20 foot minimum width into forested areas on steep slopes over a distance of more than 2500 feet. Significant additional tree removal would also be required to provide necessary width in the southeastern corner of the project area, where trees occur on either side the existing road whose width is already adequate for emergency use. Impacts of using the North King Road option are especially severe in terms of both total trees removed and in removal of larger oak trees, including two landmark size oaks.

Tree removals associated with residential construction are expected to be effectively the same regardless of which access is used since the building and septic envelopes and driveway access from subdivision roads would be the same. To estimate tree removals associated with residential construction on individual lots, including driveways and septic systems, available building and septic sites within the designated envelopes were visited for each lot based site staking that was in place at the time of review. Although trees are present on 15 of the 19 proposed residential parcels, access has been designed to allow for short driveways with preservation of trees on undeveloped areas within the parcel. Site review confirms that building and septic areas have been selected in order to minimize tree loss as favorable building sites are available in treeless areas with good access. Tree removal appears unavoidable only on lots #5 and #18 and preliminary review indicates that no oaks and only a total of 14 pine trees would have to be removed from those two lots. Development on each lot is subject to County review and the requirement to minimize tree loss. For purposes of project review and in the absence of actual site plans, it appears prudent to assume that total removal of up to 20 oaks and 30 pines might occur during the course of residential development for the project.

It should be emphasized that all the Monterey pine trees on the parcel are of unknown genetic origin and occur outside the native range of Monterey pine. None, therefore, is protected under the applicable tree protection ordinance for this area. As noted in the Forest Condition section above, most are in declining health and many will pose an increasing hazard over time.

Tree Retention for the Project

Although significantly more and larger oak trees would be removed using the North King Road access option due to removals in the road easement outside the property, more than 98% of the oak trees and all landmark size oaks within the proposed subdivision are projected to be retained regardless of the access option chosen. The proposed split lane entry retains trees that would have to be removed for a two lane access road. Estimates of total tree retention here are

considered more reliable than estimates within each diameter class due to the focused nature of the sampling scheme.

Condition of Retained Trees

The health and general condition of the retained trees is good and at least comparable to the trees being removed. Normal mortality will continue to occur as it does in all unmanaged forests, and native diseases and insects are expected to persist at normal background levels. Sudden Oak Death syndrome (SOD) is caused by the organism *Phytophthora ramorum* and has been found in Monterey County, the nearest location being a single tree in a park in Prunedale. Although no oaks on the property appear affected at this time, SOD may affect coast live oaks on the property eventually and should be monitored on a regular basis. Monterey County is subject to quarantine requirements affecting movement of materials of any susceptible species, of which coast live oak is a prime example, and may also apply to manzanita materials if they will be removed from the property. In addition, prevention and treatment recommendations are evolving over time. The best means of staying current on prevention and treatment measures is the California Oak Mortality Task Force (COMTF) website, http://www.suddenoakdeath.org).

Tree Replacement: County regulations require replanting on a 1:1 basis for all protected trees (coast live oak only in this case) removed, except where this would result in an overcrowded or unhealthy environment. Site inspection confirms that there is sufficient room to plant oaks to fulfill the objective of long-term 1:1 replacement of all protected trees being removed for project development. The precise replacement requirement should be determined by keeping a tally of all coast live oaks removed during each phase of project development and will be heavily affected by access alternative selected.

Replacement planting sites should be planned in conjunction with final development plans and shown on the Landscape Plan for the project, or if outside the scope of the Landscape Plan, on a suitable Site Map of the parcel. Required replacement trees should be planted outside areas subject to development with locations specified in consultation with a qualified forester, arborist or horticulturist. Replacement trees should have protected status after planting and in locations where they will not be subject to future construction impacts. Suitable openings for replanting occur on most parcels. Volunteer seedlings already existing on the site may be transplanted to provide preferred replacement planting stock of known local origin. If oak replanting stock is not transplanted from on-site sources, use of smaller planted trees (not be larger than 5 gallon size with one gallon or best of all D40 Treepots) is preferred since the smaller trees tend to adapt better to the planting site and studies repeatedly show better long term growth and stability.

As noted above, the planted and naturalized Monterey pines on this property are not protected trees under applicable tree ordinance provisions for this area. However, they are occupying viable oak woodland habitat and therefore replacement of Monterey pines removed for project construction is recommended on a 1:1 basis. Existing Monterey pines may be left to grow, but new seedlings should be controlled if they threaten to displace existing native oak woodland. Removal operations and disposal of pine tree materials should be done in accordance with Pitch Canker Task Force guidelines to prevent spread of pitch canker beyond the State Board of Forestry declared Zone of Infestation (effectively no shipment of untreated materials, including

logs, to or east of Interstate 5). If firewood is made, it should be kept under clear plastic to control beetle populations (this is true of oak firewood as well). If and where introduced woodland of Monterey pine is removed, such locations would be prime planting areas for replacement trees required due to native tree removals in other parts of the project and facilitate revegetation of the area with native tree species. No tree replacement is required by ordinance for other introduced trees (such as eucalyptus) being removed.

Tree Care During Construction

To protect trees during construction activities, the following measures shall be adhered to:

1) **Tree Protection Zones (TPZ) - The health and stability of trees is best protected by absolutely minimizing impacts to their root systems from vehicles, heavy equipment, foot traffic and stored materials. For all retained trees, the minimum tree protection zone is defined as the area within the tree's dripline unless specifically reviewed and approved. Around each tree or group of trees to be preserved in or next to a construction area, metal link or high visibility plastic fencing (minimum 6 feet high) supported by wood or metal stakes shall be erected along the approximate driplines of such protected trees to define the construction project boundary and create a tree protection zone for its trunk and roots. Where guidance of a tree professional is used to evaluate conditions and establish the location of protective fencing, encroachment within the dripline of retained trees may occur in order to minimize tree removals. The contractor should install protective fencing that intrudes within tree driplines only with on-site consultation and approval of a forester or qualified arborist.**

2) No storage of equipment or construction materials or parking of vehicles or operation of equipment is permitted within the TPZ

3) No soil may be removed from within the dripline of any tree and no fill of additional soil can exceed two inches (2") within the driplines of trees, unless it is part of approved construction and is reviewed by a qualified forester or certified arborist. Because existing trees are sensitive to the addition of fill, excavated material must either be removed from the site, incorporated as engineered fill beneath the driveway, or retained away from oak trunks (a minimum of one foot clearance) and as much of tree rooting zones as possible. See specific tree applications under #8 below.

4) Bark injury to any tree from equipment or materials is not acceptable and is prevented by respecting the protective fencing described above.

5) No significant tree as defined by County code may be removed or trimmed unless authorized under this Management Plan or County regulation. Tree crowns that lean into the construction area should be pruned **prior to commencement of excavation and construction** to minimize potential for inadvertent damage.

6) Roots exposed by excavation must be pruned and recovered as quickly as possible to promote callusing, closure and healthy regrowth. Where excavation will occur within tree driplines, the following root severing procedures during excavation and trenching are recommended: Gently expose and cleanly sever roots one foot further from the tree than the final limit of grading and then hand dig the final foot of width. Roots should then be cleanly pruned to the side wall of excavation with a saw, sawzall, narrow trencher with sharp blades, or clippers. Hydraulic or pneumatic excavation technologies are available which can expose and minimize damage to roots. Exposed roots should be draped immediately with at least two layers of untreated burlap or carpets secured to cover the excavated surface to a depth of 3 feet. Burlap or carpeting (or temporary fill) shall be soaked nightly and kept in place until the excavated surface is backfilled and watered.

7) All tree work shall be monitored by a qualified forester or certified arborist and work completed by qualified tree service personnel. Oaks should not be trimmed during periods of rapid growth in the spring and early summer so that deformed "witches broom" growth is not stimulated.

8) Project Specific Recommendations: To enhance tree protection, the following measures are recommended:

   a) Where trees are removed within 15 feet of retained trees, roots of the removal tree should be severed by making sharp vertical cuts at limits of approved excavation before pushing over or excavating the rootwad and trunk or by grinding the stump to at or slightly below grade rather than excavating it.
   b) To maximize tree retention and protection, a forester, arborist or other tree care professional should be involved in review and development of final grading and construction plans wherever trees occur either at within 10 feet of grading margins. In such locations, it may be possible to incorporate special retention or other construction methods that will permit safe and healthy retention of existing trees that have significant landscape value. Coordinated forestry and engineering review of road construction areas where grade changes will be two feet or less from existing ground surfaces is especially important as excavation into root bearing soil should be minimized as much as possible .
   c) Oaks in a wildland setting are adapted to dry, summer conditions. However, retained trees that have had root ends cleanly cut during excavation should be moistened regularly as described in #6 above. Occasional wetting during the dry season of retained oak rooting areas away from tree trunks will enhance tree health and vigor during the period of construction. Wood chips or other mulch should be applied to TPZs within 15' of construction activities. Chips and mulch should not be left mounded against tree trunks, however.
   d) Due to the loss of a portion of the root system, a decline in foliage may occur over time. Prune dead or dying foliage only as it occurs. It is not necessary nor advisable to reduce the size of the crown in order to compensate for loss of roots (Harris, Clark, Matheny 2004).

e) The developer and tree removal contractor should stay current on developments related to oak mortality from the *Phytophthora ramorum* pathogen by consulting the website of the California Oak Mortality Task Force (http://www.suddenoakdeath.org). Proper handling of materials infected with this pathogen is required by State and federal quarantine and is necessary to minimize spread of the disease. The Monterey County Agricultural Commissioner's office should be consulted immediately prior to any work that requires cutting and removal of oak materials from the site so that current requirement can be followed and enforced.
f) All septic tanks and leach fields should be placed a minimum of 10' from the base of a protected tree, or no closer than the dripline of the tree, whichever is further.

Project Assessment

Potential for adverse environmental impacts due to proposed tree removals in the following subject areas:

Soil Erosion: Potential is low to moderate unless the North King Road extension is widened in which case potential is moderate to high. Slopes where road and home construction will occur are generally gentle to moderate, although somewhat steeper slopes are crossed by relatively short road segments. Homesites will utilize largely treeless areas and roads within the subdivision will remove relatively few trees. Erosion control measures will be required and implemented during active construction on roads and homes. Tree planting and other landscaping mitigations will be implemented upon completion of construction activities.

Water Quality: Tree removals are generally well removed from significant water resources and can avoid all larger trees. Proposed tree removals are relatively minor and can be mitigated with proper construction and erosion control methods. Heightened care and protection measures would be appropriate if North King Road extension is widened as the easement is just above a swale bottom on the adjoining property to the east.

Ecological Impacts: Low potential. Only approximately 2% or less of the estimated tree population on the property proposed for residential parcels is projected to be removed by the project. Development rather than tree removal will cause some new fragmentation of tree and other habitats on the parcel. Replacement of decadent Monterey pines with coast live oaks will enhance occupancy by native oaks in some areas over time.

Noise Pollution: Not a significant factor after construction activities have been completed. Trees being removed are generally too small and infrequent to provide a significant sound barrier.

Air Movement: The number of trees proposed for removal will have little or no effect on the movement of air in this vicinity although removal of some larger Monterey pines will increase exposure of retained Monterey pines to wind.

Wildlife Habitat: Low impact for this parcel due to tree removal, which is very minor. Habitat connectivity from and between forested areas and other habitats remains viable both upslope and downslope after development as proposed.

Forest Management Agreement

The following standard conditions are required by the Monterey County Planning Department in Forest Management Plans and are applied whenever relevant to the project site and its trees.

Definitions

Forest Management Area (FMA). That portion of the subject parcel which is presently forested and lies beyond the immediate vicinity of the permitted building envelopes within this parcel.
Landmark tree. Any native tree more than 24" in diameter.
Significant tree. Any protected tree more than 6" in diameter.
Retained tree. Any significant tree not shown for removal on an approved final site plan.
Diameter. Thickness of main trunk of tree as measured 4'6" ("diameter at breast height or dbh") above the average ground surface at base of tree or lower, especially on oaks where trunk form permits measurement of a more representative stem diameter.
Dripline. The outer edge of the area beneath the crown of a tree.
Greenbelt. An area around the construction zone which, for purposes of fire protection, is kept free of highly flammable vegetation and is stabilized with green, growing plants.

Management Objectives

1) Minimize erosion (in order to prevent soil loss and siltation).

2) Preserve natural habitat (includes native oak forest, understory vegetation, and associated wildlife on site).

3) Prevent forest fire (i.e., uncontrolled fires.)

4) Preserve scenic forest canopy as located within any Critical Viewshed.

5) Preserve landmark trees.

Management Measures

Tree Removal. No protected tree shall be removed without a Forest Management Plan, an Amended Forest Management Plan, or a Permit where required by the County of Monterey, or unless diseased or hazardous or less than 12" and marked to improve forest health, as designated by a qualified forester.

Application Requirements. Where a Tree Removal Permit is required, trees proposed for removal will be conspicuously marked by flagging or paint. A site plan showing the location of each significant tree to be removed will accompany the application. If a substantial number of trees is requested for removal, they will generally be distributed over a wide area so that the overall unbroken appearance of the forest canopy is not altered.

Waiver of Permit Requirements. It is understood that the Director of the Monterey County Planning Department may waive the requirement to obtain a Tree Removal Permit in the following instances:

1) removal of diseased tree(s) which threaten to spread contagion to nearby healthy trees;
2) removal of dangerous tree(s) which present a clear and imminent threat to human life or property;
3) outside the FMA, removal of tree(s) where needed to allow construction of approved structures or roads.

Landmark Trees. All landmark trees will be protected from damage if not required to be removed under the above instances.

Dead Trees. Because of their great value for wildlife habitat (particularly as nesting sites for birds), large dead trees beyond the greenbelt will normally be left in place. Smaller dead trees will normally be removed in order to reduce fire hazard. Dead trees may be removed at the convenience of the owner, provided such removal is otherwise in conformance with this plan and designated by a qualified forester. Large dead trees may be removed from the greenbelt upon a finding of hazard or sufficient presence of this habitat element by a qualified forester. Dead trees, limbs, and other highly flammable material may be removed if required by Agency fire Officials, or as part of an approved Defensible Space Plan.

Thinning. Non-significant trees, where weak, diseased, or overcrowded, may be thinned to promote the growth of neighboring trees. Subject to the above permit requirements, significant trees may be removed for the same purpose. On a few portions of these parcels, stands of oaks are overcrowded with smaller trees. In such stands, thinning of trees up to 12" in diameter selected by a qualified forester or arborist is encouraged in order to promote growth of larger trees, increase understory diversity, and reduce fire hazard.

Replacement Trees. Where tree replacement is required, the appropriate replacement trees shall be planted in an area where they are free to grow, generally a clearing or gap between trees (preferably 30 feet or more between trunks), except where existing clearings are to be maintained. Exceptions will be made where a suitable seedling already exists, and in unforested garden and lawn areas. Every effort will be made to secure native seedlings rather than nursery stock of unknown origin. Coast live oak replacement trees should generally not be larger than 5 gallon size with one gallon preferred. Occasional use of larger planting stock, however, is acceptable to provide both visual and age diversity.

Protection of Trees. All significant and replacement trees, other than those approved for removal, shall be retained and maintained in good condition. Trimming, when not injurious to the health of the tree(s), may be performed wherever necessary in the judgment of the owner, particularly to reduce personal safety and fire hazards.
Retained trees which are located close to the construction site shall be protected from inadvertent damage by construction equipment through wrapping of trunks with protective materials, bridging or tunneling under major roots where exposed in the foundation or utility trenches, and other measures appropriate and necessary to protect the well-being of the retained trees (See Tree Care During Construction above).

Fire Prevention. In addition to any measures required by local or California Department of forestry fire authorities, owner will:

a. maintain spark arrester screen atop chimney;
b. maintain spark arresters on gasoline-powered equipment;
c. establish "greenbelt" by keeping vegetation around structure to a distance of 50 feet in a green, growing condition, and or controlling fuel accumulation in drought tolerant landscapes.
d. break up and clear away any dense accumulations of dead or dry underbrush or plant litter, especially near landmark trees and within greenbelt.

Use of Fire (for Clearing, Etc.). Open fires will be set or allowed within the FMA only as a forest management tool under the direction of Department of Forestry authorities, pursuant to local fire ordinances and directives.

Clearing Methods. Outside development areas, brush and other undergrowth, if removed, will be cleared through method(s) which will not materially disturb the ground surface. Hand grubbing, crushing, and mowing will normally be the methods of choice. Use of fire and herbicides will be subject to the limitations listed elsewhere in this Plan.
Areas laid bare by clearing, other than firebreaks, will be sown with a suitable erosion mix utilizing native grass and forb seeds as suitable and appropriate (if nothing else is to be planted in the area). Sowing of cleared areas will be completed prior to the onset of the winter rainy season.

Irrigation. In order to avoid further depletion of groundwater resources, prevent root disease, and otherwise maintain favorable conditions for the native oak forest, the FMA will not be irrigated except within the greenbelt area. Caution will be exercised to avoid overwatering around the trees within the greenbelt.

Exotic Plants. Care will be taken to eradicate on the four proposed parcels, and to avoid introduction of, the following pest species:

a. Pampas grass
b. Genista (Scotch broom, French broom)
c. Ecualyptus (large types).

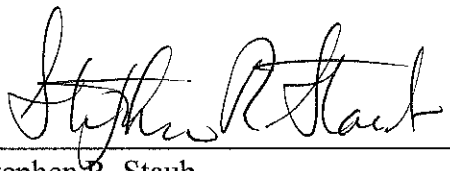
Amendments. It is understood that the Director of the Monterey County Planning Department, in consultation with the California Department of Forestry, may approve amendments to this Plan,

provided that such amendments are consistent with the provisions of the County Development Permit.

Compliance. It is further understood that failure to comply with this Plan will be considered failure to comply with the conditions of the County Development Permit.

Transfer of Responsibility. This Plan is intended to create a permanent forest management program for the site. It is understood, therefore, that in the event of change in ownership this Plan shall be as binding on the new owner(s) as it is upon the present owner. To this end, this Plan will be conveyed to the future owner upon sale of the property.

Hidden Forest Subdivision Management Plan Prepared by:



Stephen R. Staub
RPF #1911

10/19/06
Date

With major assistance from Bill Ruskin, RPF #2248

Appendix E

Updates to Existing Forest Management Plan

MEMORANDUM

Date: December 2021

To: Erik V. Lundquist, AICP, Director of Housing & Community Development

From: Matthew Johnson, Senior Project Manager, DD&A
Patric Krabacher, ISA Certified Arborist 11759, DD&A

Subject: Updates to the Existing Forest Management Plan for the La Tourette Subdivision Project

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Denise Duffy & Associates, Inc. (DD&A) is contracted by the County of Monterey (County) to provide environmental consulting services for the La Tourette Subdivision Project (project). The project includes implementation of the LaTourette Subdivision, comprised of a residential development and the division of an approximately 47.6-acre parcel into 19 lots that will range in size from 1 to 8 acres, with an average of 2.5 acres. The intent of the project is to maintain an aesthetic presence of the existing coast live oak (*Quercus agrifolia*) trees and retain ecological functions to the greatest extent feasible, while meeting project objectives and requirements. This memorandum provides a review of the existing Forest Management Plan (FMP) prepared by Staub Forestry and Environmental Consulting (Staub) (**FMP Appendix A**) to determine if updates are required for the Staub FMP to be consistent with the current regulatory framework. Updated information includes descriptions of the regulatory framework, existing forest condition and health, results from the site visit, and recommendations to preserve existing resources within the project.

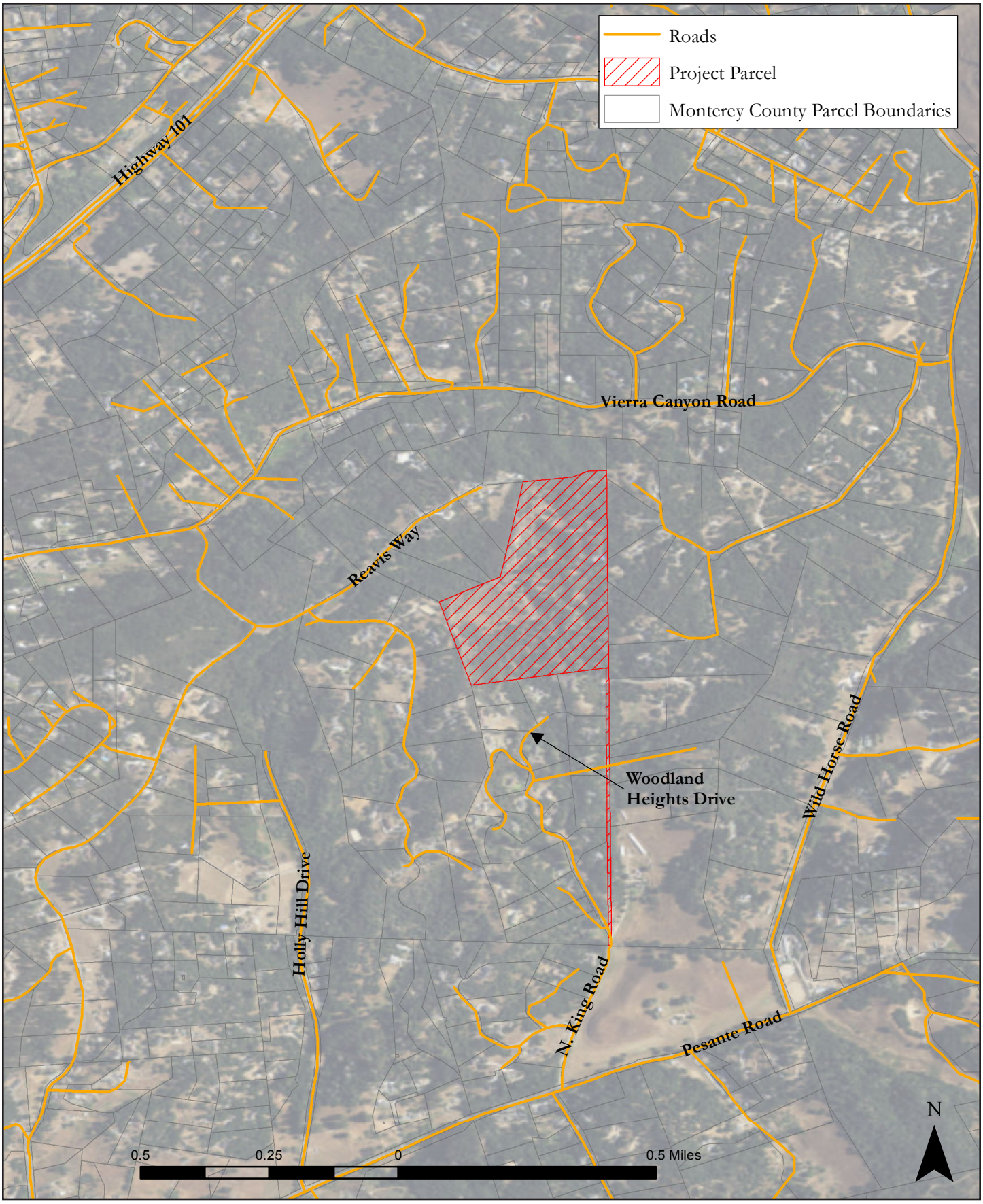
Site Description

The project is located in northern Monterey County in the unincorporated area known as the Prunedale Hills. The project site is approximately 10 miles north of Salinas and 25 miles northeast of Monterey (refer to **Figure 1**). Regional access to the site is provided from Highway 101 via Pesante Road and King Road. The project site is located at 19945 Pesante Road, north of the Pesante Road/King Road intersection. The site is approximately two miles east of Highway 101 and is immediately adjacent to the existing Woodland Heights Subdivision (refer to **Figure 2**). The Assessor's Parcel Number for the site is 125-101-016-000. The project site is approximately 46.4-acres and is zoned Low Density Residential (2.5 acres/unit) according to Title 21 Zoning Ordinance. The project area is comprised mainly of rolling hills supporting some grazing and rural residential development. Habitat types in the area include a combination of oak woodland, mixed evergreen, annual grassland, and maritime chaparral. The project site is primarily undeveloped; however, it currently includes three single-family residences (mobile homes), water tanks, and related support structures. In addition, the site is also improved with limited infrastructure improvements (i.e., on-site wells, septic systems, and utilities) to serve existing uses. Access to the existing on-site uses is provided via an existing dirt road. The internal dirt road connects the site with the existing Woodland Heights Subdivision. This road would be updated and realigned as part of the project to provide access to the proposed new residential lots. **Figure 3, Vesting Tentative Map** depicts existing on-site development, as well as general site conditions



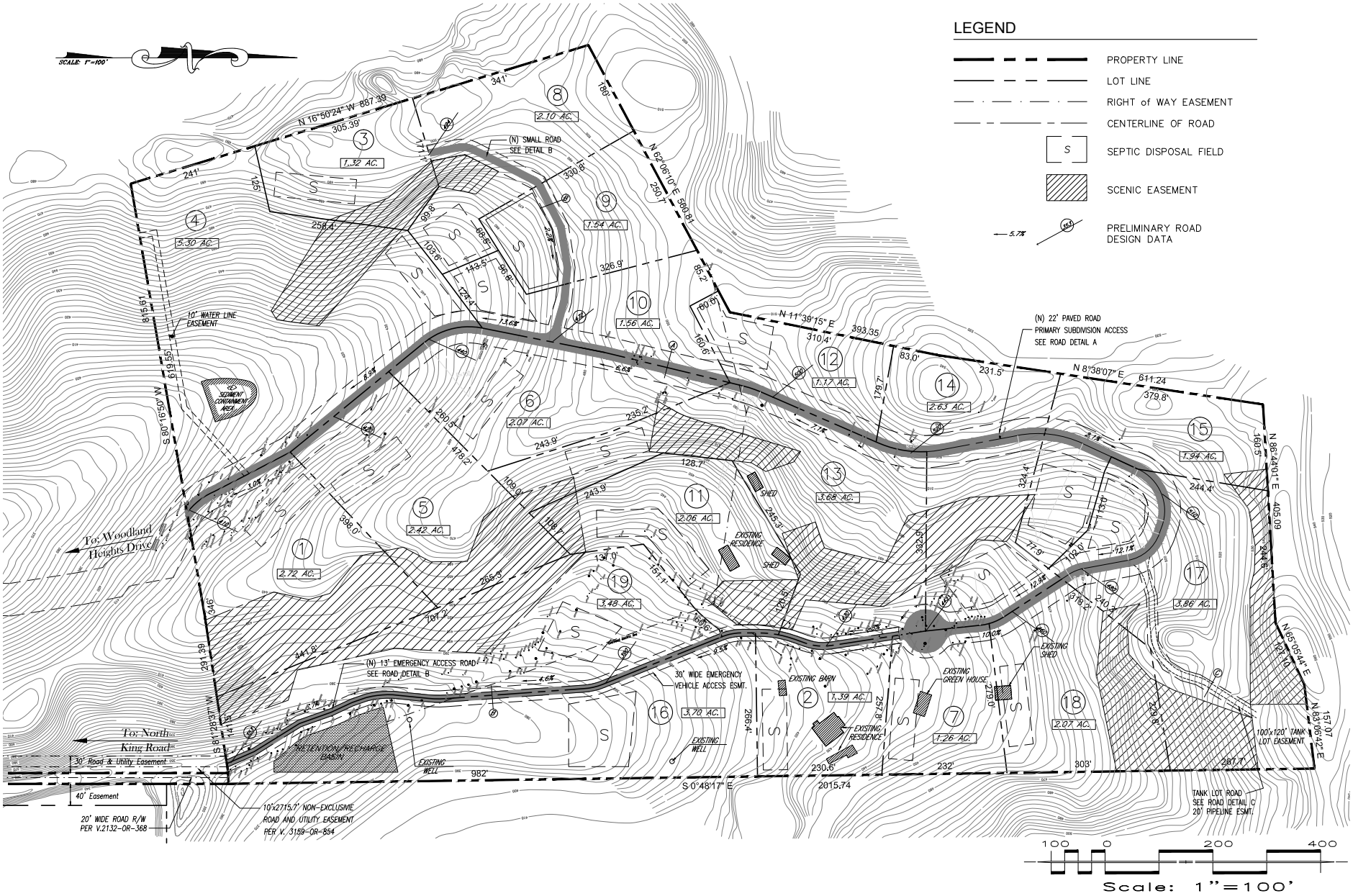
Regional Map

Figure 1



Vicinity Map

Figure
2



Vesting Tentative Map

Figure 3

Regulatory Framework

Monterey County

Applicable County ordinances associated with the project can be found in Monterey County Code, Title 16 – Environment, Chapter 16.60 – Preservation of Oak and Other Protected Trees, specific Sections within Chapter 16.60 related to the project include:

Section 16.60.030 – Regulations.

A. "No oak or madrone tree six inches or more in diameter two feet above ground level shall be removed in the North County Area Plan or Toro Area Plan areas without approval of the permit(s) required in Section 16.60.040 of this Chapter."

E. "No landmark oak tree shall be removed in any area except as may be approved by the Director of Planning pursuant to Section 16.60.040 of this Chapter. Landmark oak trees are those trees which are twenty-four (24) inches or more in diameter when measured two feet above the ground, or trees which are visually significant, historically significant, or exemplary of their species."

Section 16.60.040 – Permits required.

C. "Removal of More Than Three Protected Trees.

1. Removal of more than three protected trees on a lot in a one-year period shall require a Forest Management Plan and approval of a Use Permit by the Monterey County Planning Commission."

D. "Relocation or Replacement. As a consideration of the granting of a permit pursuant to Subsections C, the applicant shall be required to relocate or replace each removed protected tree on a one-to-one ratio. This requirement may be varied upon a showing that such a requirement will create a special hardship in the use of the site, or such replacement would be detrimental to the long-term health and maintenance of the remaining habitat."

Methodology

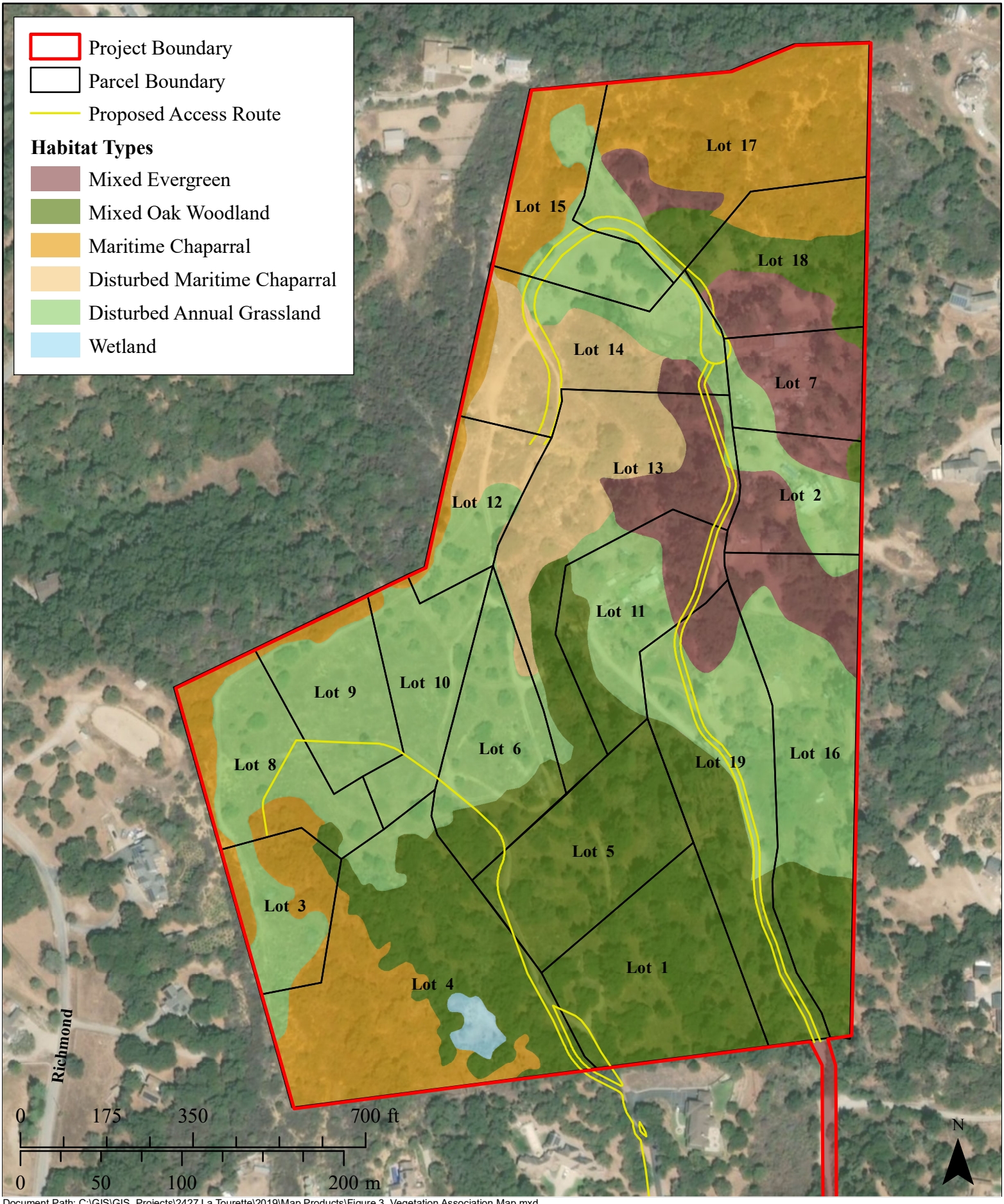
DD&A arborists conducted a site visit on January 18, 2019. The survey area included the updated entrance and proposed road through the project from Woodland Heights subdivision, North King Road extension, and all proposed parcels (Figure 1). During the site visit, DD&A arborists evaluated existing conditions, including forest health, native oak populations, potential for tree retention, and ecological impacts to provide a comparison and determine the need for an update to the Staub FMP. A Vegetation Association Map for the project was created by DD&A as part of the 2006 Biological Assessment. The map was also evaluated to determine if the oak woodland areas have changed since the previous FMP (**Figure 2**).

Forest Condition and Health

The 2006 Vegetation Association Map created by DD&A estimated approximately 17 acres of oak woodland within the project site. Following the 2019 site visit, the total area of oak woodland has decreased to approximately 13 acres (**Figure 4**). The area of oak woodland has decreased over the past thirteen years since the Staub FMP (**FMP Appendix A**), in 2019 mixed oak woodland was observed within thirteen (13) parcels (parcels 1, 2, 3, 4, 5, 6, 7, 8, 11, 13, 16, 17, and 18)(**Figure 4**) with a total of approximately 16.7 acres, and the Staub FMP recorded mixed oak woodland within fourteen (14) parcels (parcels 1 2, 4, 5, 6, 7, 11, 13, 14, 15, 16, 17, 18, and 19)(**Figure 5**) with a total of approximately 13.5 acres.

The difference from the 2006 Staub FMP to the recent site visit was a decrease in approximately 3.2 acres of area classified as oak woodland (**Figures 4 and 5**). The decrease in oak woodland habitat area was not attributed to changes in the vegetation but instead it was the advancements in mapping technology, including improvements to aerial photography and GPS/GIS software. Oak woodland existing within ten parcels reflects the capability of the property to support a dense and contiguous native oak woodland canopy, recommendations are included below to ensure proper management of this resource as a component of the proposed development. The Staub FMP rated most of the oak woodland in good condition. Following site inspection DD&A documented indications of tree health impacts, including 30% foliar dieback, minor evidence of decay, as well as indications of biotic and abiotic stressors. These indicators would reduce the rating for most the oak woodland to fair. DD&A observed that the density of coast live oak trees varies within the project from densely populated woodland to sparsely populated. This observation was consistent with the Staub FMP. Sparsely populated woodland habitats were more prevalent on the eastern and southern facing slopes, and denser woodland habitats were prevalent on the upper, western, and northern facing slopes. The denser stands (or "clustered" stands) tended to occur in the openings on the upper slopes of the property. The total number of landmark trees present within the property is estimated to remain consistent with those counts conducted in the Staub FMP (**FMP Appendix A)**. Because of the edaphic influences they are exposed to, landmark sized trees will be examined during each phase of the project as described in the recommendations section below.

In the 13 years since the Staub FMP was prepared, conversion of oak woodland to mixed evergreen within parcels 2, 7, 11, 13, 17, 18, and 19 has increased. DD&A observed non-native tree species encroaching within oak woodland. The greatest number of non-native trees within the project area (bluegum eucalyptus [*Eucalyptus globulus*], and Monterey pine [*Pinus radiata*]) are near residences in the eastern portion of the project, along the North King Road extension. Areas dominated by the non-native tree species (approximately 4 acres of the project site) have been classified as mixed evergreen. While mixed evergreen does include coast live oaks, the understory is not consistent with the species typically identified in oak woodland. During the site visit, DD&A found approximately 23 bluegum eucalyptus trees along North King Road extension had been removed, and approximately five Monterey pines had been topped. These trees' proximity to existing power lines suggests that they were removed due to their poor condition and hazard they presented to overhead utility lines. The removal of these trees will reduce the previous tree estimates shown in Table 1 of the Staub FMP. As stated in the Staub FMP "planted Monterey pines are quickly approaching the end of their life expectancy". During the site visit it was determined that most if not all, Monterey pine trees are dead or dying. The poor condition of these trees is likely due to either to pitch canker (*Fusarium circinatum*), a fungus that infects many species of pine, or to stress from recent drought conditions. Advancing mortality of these trees is evident, and due to their size, they present a hazard to life and property. However, DD&A did observe some of these dead trees provide habitat for cavity-nesting wildlife. The dryness of the site and reduction of decomposition observed in the Staub FMP was also observed during the site visit. As noted in the Staub FMP, this condition is a fire hazard. The accumulation of fire fuel has been exacerbated by the lack of management. This buildup is particularly evident beneath the stands of bluegum eucalyptus and Monterey pine, specifically near the existing residences on the eastern portion of the project. Ongoing regeneration of non-native tree species will pose a management problem into the future.



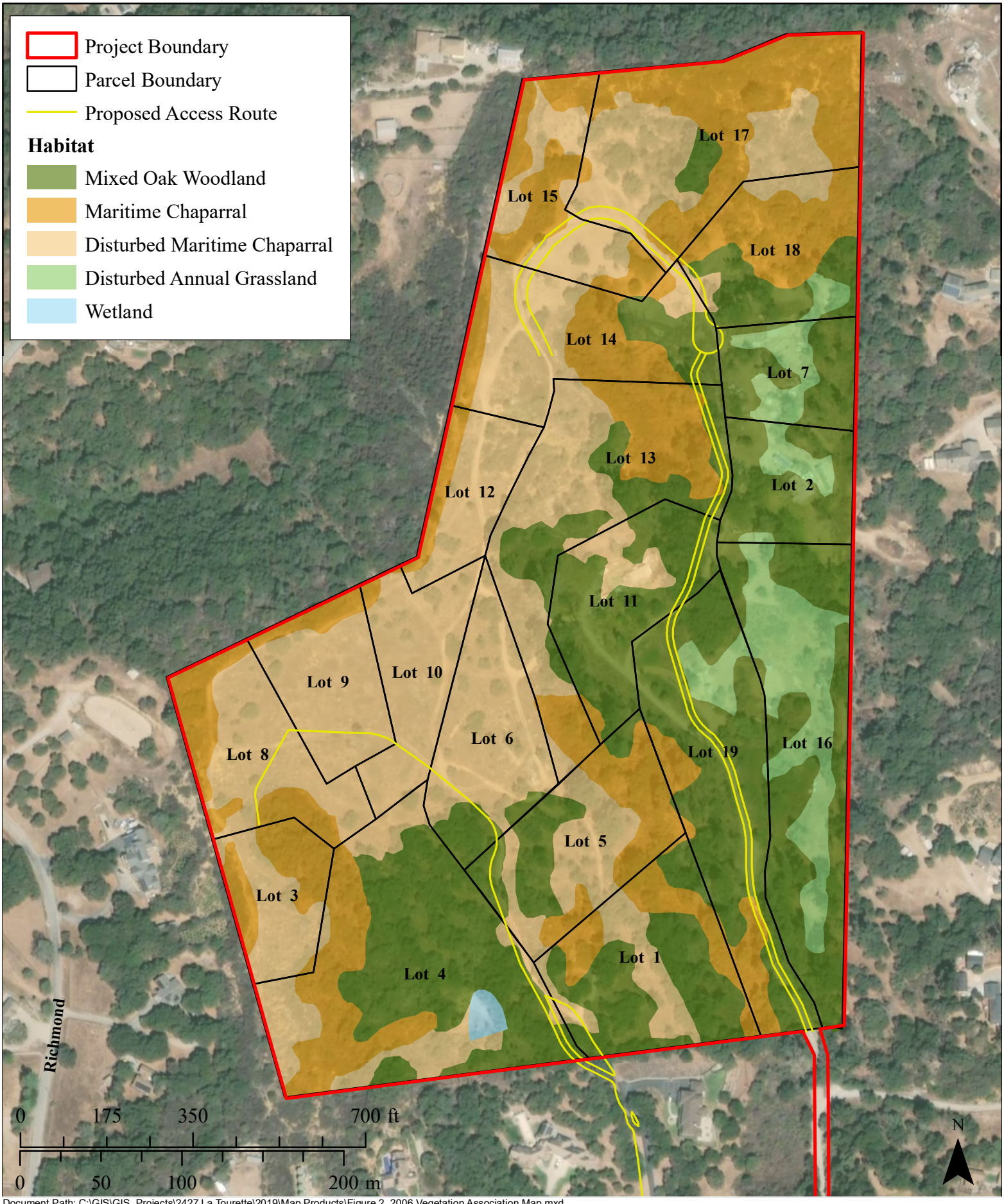
Document Path: C:\GIS\GIS_Projects\2427 La Tourette\2019\Map Products\Figure 3. Vegetation Association Map.mxd

2019 Vegetation Association Map

Date: 3/6/2019
Scale: 1 inch = 300 feet
Project: 2427

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
947 Cass Street, Suite 5
Monterey, CA 93940
(831) 373-4341

Figure 4



Document Path: C:\GIS\GIS_Projects\2427 La Tourette\2019\Map Products\Figure 2. 2006 Vegetation Association Map.mxd

2006 Vegetation Association Map

Date: 3/6/2019
Scale: 1 inch = 300 feet
Project: 2427

Monterey | San Jose
Denise Duffy and Associates, Inc.
Environmental Consultants Resource Planners
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Figure 5

Results

Oak woodland conditions, for most of the oak woodland habitat areas, have degraded since the Staub FMP within the project from good (little appearance of decay or disease, good canopy development and color) to fair (thriving, with minor evidence of decay or disease and less than 30% foliar dieback). Abiotic stressors identified during the site visit include the lack of sufficient hydrology associated with recent drought conditions. Biotic stressors identified in the Staub FMP, including native oak pathogens and pitch canker. Evidence of both of these biotic stressors were confirmed by DD&A during the site visit. Additional biotic stressors identified include oak branch canker *(Diplodia quer*ina), phytophthora root/crown rot, oak ambrosia beetles *(Monarthrum spec*ies), and oak bark beetles *(Pseudopityophthorus spec*ies). However, DD&A did not observe any indication of sudden oak death (SOD) (*Phytophthora ramorum*) within the project. According to the California Oak Mortality Task Force (a task force under the California Forest Pest Council) (suddenoakdeath.org, 2021), the closest mapped SOD site was recorded in 2017 north of Highway 129 in Santa Cruz County, approximately nine miles from the project. Currently, most coast live oak foliage dieback observed appears to be from Phytophthora Root/Crown Rot, in combination with bark beetles. Phytophthora cause crown and root rot diseases of herbaceous and woody plants. The pathogen kills plants by growing from the roots up through the root crown and into the lower trunk, where it kills the inner bark and causes a browning of the outer layer of sapwood. The predominance of trees in fair condition is characteristic of native, unmanaged oak woodlands. DD&A also observed a lack of oak seedlings or saplings, the reduction of coast live oak regeneration is a statewide problem due to a variety of factors. Factors deterring regeneration observed during the site visit include wildlife browsing, avian and rodent predation, and competition for moisture with non-native annual grasses.

Recommendations

The following recommendations are made to maintain an aesthetic presence of existing coast live oak trees and retain ecological functions to the greatest extent feasible, while meeting project objectives and requirements.

Recommendation 1

All recommendations from the Staub FMP (**FMP Appendix A**), excepting tree replacement recommendations (which are updated below using current standards), should be considered during the design stage for each parcel.

Recommendation 2

Avoidance of oak woodland and individual trees should be considered during the design stage for all aspects of the project, to retain the healthy contiguous stands of the oak woodland resources identified above. If avoidance is not feasible, tree replacement should be implemented in compliance with local, state, and federal regulations.

Recommendation 3

To reduce the loss of individual trees, all coast live oak trees 6" or larger shall be replaced on a 1:1 basis by planting or transplanting trees in areas of suitable soil as determined appropriate by a professional forester. The following is recommended:

- A tree replacement plan shall be prepared by a qualified professional forester, arborist, or horticulturist, and will be subject to review and approval by the County Planning & Building Inspection Department, that includes the following:
    - Identify tree planting areas with suitable soils that will also fulfill project landscape plans and visual screening objectives, as feasible.

- Identify monitoring requirements, such as a site inspection at the end of the first winter after planting to confirm numbers, species of replacement, and locations of plantings. Annual inspections over five years shall confirm the objective of the plan, such as the survivability of the plantings, and the percentage of healthy trees.
- At least 70 percent of the plantings shall be established/surviving by five years or monitoring (and replacement) shall continue until compliance is achieved.
- The location and species of all required replacement trees planted shall be mapped so they can be monitored for over the five-year period. The monitoring period shall be extended for individual trees that die or are in poor health and must be replaced.
- Transplanting of onsite native seedlings within construction areas and protection of those occurring near construction areas to maintain natural diversity and adaptation.
- All replacement trees shall be of local genetic stock.
- Replanting should avoid open spaces where currently there are no trees unless there is evidence of soil deep enough and of good enough quality to support the plantings.
- Most replacement shall be of a small size (cell or one gallon) as studies have shown that small trees more readily adapt to a site and grow larger over the mid-to long-term.
- Provide an adaptive management scenario if the success criteria are not being met.
- Require that tree removal of native oaks and pines 6" or larger for future lot construction be subject to County approval and appropriate tree replacement. A tree protection plan detailing tree removal and replacement and protection measures for retained trees shall be required for each lot where trees 6" or larger will be removed. The plan shall be considered a site specific amendment to the Forest Management Plan for the project, which applies to all lots.

Recommendation 4

To map the existing contiguous oak woodland stands more accurately, it is recommended that current aerial photography be captured or gathered to utilize during all phases of the project. This will help avoid existing oak woodland stands to the greatest extent feasible and help to create a more contiguous forest.

Recommendation 4

Prior to the construction of the project, it is recommended that a certified Arborist or Forester submit an arborist report to determine specific recommendations and requirements. These recommendations may include but are not limited to,

- Avoid grading, filling, and all construction activity within the dripline of oak trees, where possible. Any construction or activity within the dripline of oak trees shall be reviewed and approved by a qualified forester or arborist with their recommendations for protection as appropriate.

- Develop standards that shall include oak tree protection as outlined in the Forest Management Plan on individual lots as part of future home construction, as well as guidelines for appropriate landscaping management to protect remaining oaks. Wherever possible, future homes should be sited outside of the dripline of any oak.
- Direct all drainage from developed areas away from low or flat areas near trees to prevent saturation of soils at the base of trees.

Recommendation 5

Prior to the construction for each parcel, it is recommended that a certified Arborist or Forester submit an arborist report to determine parcel-specific recommendations and requirements. These recommendations may include but are not limited to, utilizing the existing trees, and minimizing impacts to existing oaks, installation of screening trees, avoidance of landmark sized trees, avoidance of slopes greater than 30%, and analyzing impacts to soil from erosion.

Conclusion

The Forest Management Agreement section in the Staub FMP is consistent with the Counties standards required in a Forest Management Plan and should be applied whenever pertinent to the project site. It is also suggested that all recommendations above be adopted to maintain an aesthetic presence of existing coast live oak trees and retain ecological functions.

If you have any questions or comments regarding this memorandum, please feel free to contact Tyler Potter or Patric Krabacher at (831) 373-4341.

References

Monterey County. 2009. Monterey County Voluntary Oak Woodland Stewardship Guidelines (September 2009).

California Oak Mortality Task Force. 2018. Suddenoakdeath.org (January 2019)

FMP Appendices

FMP Appendix A. Staub Forestry and Environmental Consulting 2006 Forest Management Plan for Monterey County APN 125-101-016

FMP Appendix A.

Staub Forestry and Environmental Consulting 2006 Forest Management Plan

for

Monterey County APN 125-101-016

Staub Forestry &
Environmental Consulting

FOREST MANAGEMENT PLAN

for

Monterey County APN 125-101-016

Prepared For

Jeffery and Monica La Tourette

Prepared by

Staub Forestry and Environmental Consulting

Stephen R. Staub
Registered Professional Forester
License #1911

Bill Ruskin
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October 2006

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FOREST MANAGEMENT PLAN

for

Hidden Forest Subdivision, Monterey County

APN 125-101-016

Owner/Applicant: Jeffrey and Monica La Tourette
8754 Woodland Heights Place
Prunedale, CA 93907

Introduction

This Forest Management Plan is prepared for Jeffrey and Monica La Tourette by Stephen R. Staub, Registered Professional Forester #1911 and Bill Ruskin, Registered Professional Forester #2248. It is to be made a part of an application for a 19-lot residential subdivision of this approximately 47.8 acre property, which is located about 3 miles southeast of the town of Prunedale. The Forest Management Plan is subject to the requirements of Zoning Ordinance #21.64.260, which applies restrictions for the preservation of oak and other protected trees as required in the Monterey County General Plan, area plans, and master plans. The scope of this plan covers the trees on the entire property with particular emphasis on trees that will be impacted by construction of road and common driveway infrastructure. Initial site review was done in 2004 and 2005 with final fieldwork and data collection completed on September 18th and 25th, 2006.

Site Description

Assessor's Parcel Number: 125-101-016 to be subdivided as delineated on the Vesting Tentative Map (dated May 25, 2006) prepared by Monterey County Surveyors, Inc.

Location: Approximately 3 miles southeast of the town of Prunedale. Primary access will be east of Highway 101 from Pesante Road to North King Road.

Parcel Size:
APN 125-101-016 = approximately 47.8 acres.

Existing Land Use: Rural residential (2 existing residences), past history of farming and greenhouse agriculture.

Slope: Slopes within proposed residential lots are generally less than 30%, sometimes exceeding 30% outside building envelopes. The parcel contains both gentle to moderate swale/valley bottoms and ridgetops and moderate to somewhat steeper sidehills

Soils: Soils on the property are loamy sands that formed on hills and uplands in old marine sand dunes or in materials weathered from soft sandstone. The Soil Survey of Monterey County, California (USDA, 1978.) shows predominantly Arnold series loamy sands with inclusions of other soils such as Oceano loamy sands and Santa Ynez and Elkhorn fine sandy loams. Surface layers tend to be grayish brown to dark brown with variable depths and concentrations of clay in the subsoil.

Vegetation: Parcel vegetation is a mix of disturbed annual grassland, coast live oak woodland mixed with planted trees, and maritime chaparral. Oak woodland is concentrated in lower areas and on east facing side slopes. Maritime chaparral occurs in more upland and ridgetop areas on the site where soils are shallower and may have some clay restrictions in the subsoil. Habitat mapping by Denise Duffy and Associates estimates annual grassland at just over 19 acres, oak woodland at nearly 17 acres and maritime chaparral at more than 11 acres. See the Biological Assessment of the project prepared by Denise Duffy Associates for a more complete description of parcel vegetation.

There is an obvious history of introduction of numerous exotic tree species and as well as regionally common trees which are not native to this site. The most prominent non-native trees on the property are Monterey pines (*Pinus radiata*), Eucalyptus (*Eucalyptus spp.)* and Coast Redwood (*Sequoia sempervirens*). Monterey Pine dominates portions of parcels 1, 5, 6, 16, 18, and 19. Eucalyptus dominates portions of parcels 11, 13, 15, 16, 17, and 18. Coast redwoods appear to have been planted on parcels 1, 6, and 11, and have survived in small clumps. Monterey pine has also been planted as a boundary fence along the eastern property boundary and short portion of the western property boundary. The planted pine trees appear to be on the order of 40 years old and are nearing the end of their expected life. There are numerous seedlings propagating both of Monterey Pine and Eucalyptus.

Vegetation on most of the property has been significantly influenced by past and current agricultural and ranching activities, including the planting of trees not native to the site. There remain numerous fruit bearing and landscape trees around the home sites. A large clearing project was conducted in recent years on portions of parcels 1, 3, 4, 5, 6, 7, 8, 9, and 10, which was intended to facilitate an organic farming lease, which never came to fruition. Vegetation in this area is now best characterized as disturbed annual grassland with some occupation of invasive exotics (pampas grass).

Forest Condition and Health: As indicated above, the roughly 17 acres of forest cover on the property has been greatly influenced by past management activities. There remains a large stand of coast live oak forest within parcels 1, 3, 4, 5, and 7, which reflects the capability of the property to support a fairly dense and vigorous native tree canopy. Clearly a significant native cover type here, the stand supports a few rather large specimens at the bottom of the drainage with generally smaller, often younger trees occurring on the sideslopes. Similar conditions occur

within portions of parcels 2, 11, and 19 as well. Oak foliage generally has good color and density indicating reasonable overall health. Oaks on the property are generally thriving where not dominated by non-native trees. The presence of internal decay and cavities was noted from time to time and represents a useful niche habitat that is likely to increase as the forest matures. Native oak pathogens appear to be present at more or less normal background levels.

The overly dense and non-native plantings throughout the eastern area of the property are problematic. The planted Monterey Pines are quickly approaching the end of their life expectancy, and due to the dryness of the site, are now susceptible to insect attack and other diseases (including pitch canker). Advancing mortality of these trees is evident, and due to their size, has become and will continue to be a failure hazard for current residents and visitors. At least five or six larger Monterey pines have failed in the last few years, two of which damaged improvements and vehicles. Some of the older dead trees appear to support active wildlife use as long as the snag is standing. The dryness of the site reduces decomposition which has resulted in an ominous buildup of dry fuel on the forest floor beneath these trees. This is particularly evident beneath the stands of bluegum eucalyptus (*Eucalyptus globulus*). Ongoing regeneration of both these non-native tree species here will pose a management problem into the future.

Project Description

The project proposes subdivision of the parcel into 19 residential lots, with a minimum lot size of just over 1 acre and a maximum lot size of more than 8 acres. Building and septic envelopes have been designated for each parcel as well as a number of areas that are to remain undisturbed. Existing dirt roads will be realigned in some areas and widened and paved to provide appropriate residential access. Primary access is proposed over roads and an existing easement through the adjoining Woodland Heights subdivision. Existing direct access to the property over North King Road is proposed for use as secondary and emergency access only. Potential tree impacts of widening the North King Road route for principal residential access were also analyzed as part of project review.

Potential home sites within each lot will be located on gentle to moderate terrain. The home sites and septic locations have been situated to avoid tree loss in construction, favoring previously cleared areas. Should subsequent owners plan to move either the building site or the septic location, any additional tree loss other than what is anticipated here would be subject to the permitting process for that individual project. Percolation tests on proposed septic areas have been completed. Building sites on three parcels make use of pre-existing building areas.

Estimated Native Oak Population

To characterize stand structure and tree numbers, random tree density measurements by diameter class on five, tenth acre plots were taken across the range of oak woodland cover types. These three general types consist of: 1) larger diameter oaks, with fewer trees located in lower flat lands. 2) Medium diameter oaks, with higher densities of trees located in flats and moderate slopes, and 3) smaller diameter trees, with higher densities located on ridges. Following the acreage of mixed oak woodland mapped by Denise Duffy and Associates, confirmed by field

reconnaissance and USGS 1998 aerial photography, we applied the results of our sampling to 17 acres to estimate the total population of native oaks on the parcel. A significant number of the oak trees have multiple trunks so actual stem density is greater than the number of reported trees. While only a small percentage of the total number of trees was actually measured, the sampling is adequate for purposes of general description and scoping of potential project impacts.

Planted trees occur in concentrated areas and so are not well estimated by systematic random sampling. Therefore a tally of all non-native trees (except ornamentals and those planted on the eastern and southern boundaries) was made throughout the project area to characterize the presence and occupancy of the site by non-native trees that have been planted or seeded in from planted trees. The numerous planted, non-native trees along the eastern property boundary are not included in these numbers as they are not impacted by the proposed project.

Based on the combination of sampling and tallies, Table 1 estimates the tree population on the property by species and diameter class.

Table 1: Estimated Native*/Non-Native Tree Population			
Diameter class	6-11"	12-23"	23+"
Coast Live Oak	1142	534	32
Monterey Pine	69	98	79
Eucalyptus	18	34	12
Coast Redwood	9	13	0

*Coast live oak is the only species listed in the table that is native to the project site.

Estimated Tree Removal for the Project

Estimates of tree removals necessary to complete the project were made separately for proposed roads and for residential construction on individual lots. To estimate tree removals necessary to construct the proposed primary access roads, Monterey County Surveyors, Inc. performed several separate tree surveys in order to cover trees potentially affected over both the proposed route through Woodland Heights with emergency access only out the North King Road extension and for an alternate route using the North King Road extension as the primary access with emergency access only through Woodland Heights. In March of 2005 a survey was conducted to inventory removal trees for primary access along the North King road extension for the first 1,600' south of the property boundary to a point where access for a four lot subdivision is under consideration. Tree locations along proposed roads for both alternatives within the development were surveyed in 2006. In September 2006, we tallied tree removals necessary to use the North King Road extension as a primary access from 1600' south of the property to its junction with the paved road below the Woodland Heights subdivision gate to complete estimation of tree removal for this alternative. Tree removals for roads and associated infrastructure were estimated by tallying individual trees too close to proposed construction to be retained as shown on current project maps prepared by Monterey County Surveyors. Tree mapping and appropriateness of removal were reviewed in the field with effective staking in place.

A comparison of tree removal associated with the two different primary access alternatives is given in Table 2.

Table 2: Estimated Tree Removals for Two Primary Access Alternatives

Primary Access Route	Oaks				Pines				TOTAL
	6-11"	12-23"	24"+	Sum	6-11"	12-23"	24"+	Sum	
Woodland Heights	8	1	0	9	1	0	18	19	**28**
North King Road	73	33	2	108	0	11	30	41	**149**

Significantly more tree removal is required on the North King Road option primarily because the existing road must be expanded to at least a 20 foot minimum width into forested areas on steep slopes over a distance of more than 2500 feet. Significant additional tree removal would also be required to provide necessary width in the southeastern corner of the project area, where trees occur on either side the existing road whose width is already adequate for emergency use. Impacts of using the North King Road option are especially severe in terms of both total trees removed and in removal of larger oak trees, including two landmark size oaks.

Tree removals associated with residential construction are expected to be effectively the same regardless of which access is used since the building and septic envelopes and driveway access from subdivision roads would be the same. To estimate tree removals associated with residential construction on individual lots, including driveways and septic systems, available building and septic sites within the designated envelopes were visited for each lot based site staking that was in place at the time of review. Although trees are present on 15 of the 19 proposed residential parcels, access has been designed to allow for short driveways with preservation of trees on undeveloped areas within the parcel. Site review confirms that building and septic areas have been selected in order to minimize tree loss as favorable building sites are available in treeless areas with good access. Tree removal appears unavoidable only on lots #5 and #18 and preliminary review indicates that no oaks and only a total of 14 pine trees would have to be removed from those two lots. Development on each lot is subject to County review and the requirement to minimize tree loss. For purposes of project review and in the absence of actual site plans, it appears prudent to assume that total removal of up to 20 oaks and 30 pines might occur during the course of residential development for the project.

It should be emphasized that all the Monterey pine trees on the parcel are of unknown genetic origin and occur outside the native range of Monterey pine. None, therefore, is protected under the applicable tree protection ordinance for this area. As noted in the Forest Condition section above, most are in declining health and many will pose an increasing hazard over time.

Tree Retention for the Project

Although significantly more and larger oak trees would be removed using the North King Road access option due to removals in the road easement outside the property, more than 98% of the oak trees and all landmark size oaks within the proposed subdivision are projected to be retained regardless of the access option chosen. The proposed split lane entry retains trees that would have to be removed for a two lane access road. Estimates of total tree retention here are

considered more reliable than estimates within each diameter class due to the focused nature of the sampling scheme.

Condition of Retained Trees

The health and general condition of the retained trees is good and at least comparable to the trees being removed. Normal mortality will continue to occur as it does in all unmanaged forests, and native diseases and insects are expected to persist at normal background levels. Sudden Oak Death syndrome (SOD) is caused by the organism *Phytophthora ramorum* and has been found in Monterey County, the nearest location being a single tree in a park in Prunedale. Although no oaks on the property appear affected at this time, SOD may affect coast live oaks on the property eventually and should be monitored on a regular basis. Monterey County is subject to quarantine requirements affecting movement of materials of any susceptible species, of which coast live oak is a prime example, and may also apply to manzanita materials if they will be removed from the property. In addition, prevention and treatment recommendations are evolving over time. The best means of staying current on prevention and treatment measures is the California Oak Mortality Task Force (COMTF) website, http://www.suddenoakdeath.org).

Tree Replacement: County regulations require replanting on a 1:1 basis for all protected trees (coast live oak only in this case) removed, except where this would result in an overcrowded or unhealthy environment. Site inspection confirms that there is sufficient room to plant oaks to fulfill the objective of long-term 1:1 replacement of all protected trees being removed for project development. The precise replacement requirement should be determined by keeping a tally of all coast live oaks removed during each phase of project development and will be heavily affected by access alternative selected.

Replacement planting sites should be planned in conjunction with final development plans and shown on the Landscape Plan for the project, or if outside the scope of the Landscape Plan, on a suitable Site Map of the parcel. Required replacement trees should be planted outside areas subject to development with locations specified in consultation with a qualified forester, arborist or horticulturist. Replacement trees should have protected status after planting and in locations where they will not be subject to future construction impacts. Suitable openings for replanting occur on most parcels. Volunteer seedlings already existing on the site may be transplanted to provide preferred replacement planting stock of known local origin. If oak replanting stock is not transplanted from on-site sources, use of smaller planted trees (not be larger than 5 gallon size with one gallon or best of all D40 Treepots) is preferred since the smaller trees tend to adapt better to the planting site and studies repeatedly show better long term growth and stability.

As noted above, the planted and naturalized Monterey pines on this property are not protected trees under applicable tree ordinance provisions for this area. However, they are occupying viable oak woodland habitat and therefore replacement of Monterey pines removed for project construction is recommended on a 1:1 basis. Existing Monterey pines may be left to grow, but new seedlings should be controlled if they threaten to displace existing native oak woodland. Removal operations and disposal of pine tree materials should be done in accordance with Pitch Canker Task Force guidelines to prevent spread of pitch canker beyond the State Board of Forestry declared Zone of Infestation (effectively no shipment of untreated materials, including

logs, to or east of Interstate 5). If firewood is made, it should be kept under clear plastic to control beetle populations (this is true of oak firewood as well). If and where introduced woodland of Monterey pine is removed, such locations would be prime planting areas for replacement trees required due to native tree removals in other parts of the project and facilitate revegetation of the area with native tree species. No tree replacement is required by ordinance for other introduced trees (such as eucalyptus) being removed.

Tree Care During Construction

To protect trees during construction activities, the following measures shall be adhered to:

1) **Tree Protection Zones (TPZ) - The health and stability of trees is best protected by absolutely minimizing impacts to their root systems from vehicles, heavy equipment, foot traffic and stored materials. For all retained trees, the minimum tree protection zone is defined as the area within the tree's dripline unless specifically reviewed and approved. Around each tree or group of trees to be preserved in or next to a construction area, metal link or high visibility plastic fencing (minimum 6 feet high) supported by wood or metal stakes shall be erected along the approximate driplines of such protected trees to define the construction project boundary and create a tree protection zone for its trunk and roots. Where guidance of a tree professional is used to evaluate conditions and establish the location of protective fencing, encroachment within the dripline of retained trees may occur in order to minimize tree removals. The contractor should install protective fencing that intrudes within tree driplines only with on-site consultation and approval of a forester or qualified arborist.**

2) No storage of equipment or construction materials or parking of vehicles or operation of equipment is permitted within the TPZ

3) No soil may be removed from within the dripline of any tree and no fill of additional soil can exceed two inches (2") within the driplines of trees, unless it is part of approved construction and is reviewed by a qualified forester or certified arborist. Because existing trees are sensitive to the addition of fill, excavated material must either be removed from the site, incorporated as engineered fill beneath the driveway, or retained away from oak trunks (a minimum of one foot clearance) and as much of tree rooting zones as possible. See specific tree applications under #8 below.

4) Bark injury to any tree from equipment or materials is not acceptable and is prevented by respecting the protective fencing described above.

5) No significant tree as defined by County code may be removed or trimmed unless authorized under this Management Plan or County regulation. Tree crowns that lean into the construction area should be pruned **prior to commencement of excavation and construction** to minimize potential for inadvertent damage.

6) Roots exposed by excavation must be pruned and recovered as quickly as possible to promote callusing, closure and healthy regrowth. Where excavation will occur within tree driplines, the following root severing procedures during excavation and trenching are recommended: Gently expose and cleanly sever roots one foot further from the tree than the final limit of grading and then hand dig the final foot of width. Roots should then be cleanly pruned to the side wall of excavation with a saw, sawzall, narrow trencher with sharp blades, or clippers. Hydraulic or pneumatic excavation technologies are available which can expose and minimize damage to roots. Exposed roots should be draped immediately with at least two layers of untreated burlap or carpets secured to cover the excavated surface to a depth of 3 feet. Burlap or carpeting (or temporary fill) shall be soaked nightly and kept in place until the excavated surface is backfilled and watered.

7) All tree work shall be monitored by a qualified forester or certified arborist and work completed by qualified tree service personnel. Oaks should not be trimmed during periods of rapid growth in the spring and early summer so that deformed "witches broom" growth is not stimulated.

8) Project Specific Recommendations: To enhance tree protection, the following measures are recommended:

   a) Where trees are removed within 15 feet of retained trees, roots of the removal tree should be severed by making sharp vertical cuts at limits of approved excavation before pushing over or excavating the rootwad and trunk or by grinding the stump to at or slightly below grade rather than excavating it.
   b) To maximize tree retention and protection, a forester, arborist or other tree care professional should be involved in review and development of final grading and construction plans wherever trees occur either at within 10 feet of grading margins. In such locations, it may be possible to incorporate special retention or other construction methods that will permit safe and healthy retention of existing trees that have significant landscape value. Coordinated forestry and engineering review of road construction areas where grade changes will be two feet or less from existing ground surfaces is especially important as excavation into root bearing soil should be minimized as much as possible .
   c) Oaks in a wildland setting are adapted to dry, summer conditions. However, retained trees that have had root ends cleanly cut during excavation should be moistened regularly as described in #6 above. Occasional wetting during the dry season of retained oak rooting areas away from tree trunks will enhance tree health and vigor during the period of construction. Wood chips or other mulch should be applied to TPZs within 15' of construction activities. Chips and mulch should not be left mounded against tree trunks, however.
   d) Due to the loss of a portion of the root system, a decline in foliage may occur over time. Prune dead or dying foliage only as it occurs. It is not necessary nor advisable to reduce the size of the crown in order to compensate for loss of roots (Harris, Clark, Matheny 2004).

e) The developer and tree removal contractor should stay current on developments related to oak mortality from the *Phytophthora ramorum* pathogen by consulting the website of the California Oak Mortality Task Force (http://www.suddenoakdeath.org). Proper handling of materials infected with this pathogen is required by State and federal quarantine and is necessary to minimize spread of the disease. The Monterey County Agricultural Commissioner's office should be consulted immediately prior to any work that requires cutting and removal of oak materials from the site so that current requirement can be followed and enforced.
f) All septic tanks and leach fields should be placed a minimum of 10' from the base of a protected tree, or no closer than the dripline of the tree, whichever is further.

Project Assessment

Potential for adverse environmental impacts due to proposed tree removals in the following subject areas:

Soil Erosion: Potential is low to moderate unless the North King Road extension is widened in which case potential is moderate to high. Slopes where road and home construction will occur are generally gentle to moderate, although somewhat steeper slopes are crossed by relatively short road segments. Homesites will utilize largely treeless areas and roads within the subdivision will remove relatively few trees. Erosion control measures will be required and implemented during active construction on roads and homes. Tree planting and other landscaping mitigations will be implemented upon completion of construction activities.

Water Quality: Tree removals are generally well removed from significant water resources and can avoid all larger trees. Proposed tree removals are relatively minor and can be mitigated with proper construction and erosion control methods. Heightened care and protection measures would be appropriate if North King Road extension is widened as the easement is just above a swale bottom on the adjoining property to the east.

Ecological Impacts: Low potential. Only approximately 2% or less of the estimated tree population on the property proposed for residential parcels is projected to be removed by the project. Development rather than tree removal will cause some new fragmentation of tree and other habitats on the parcel. Replacement of decadent Monterey pines with coast live oaks will enhance occupancy by native oaks in some areas over time.

Noise Pollution: Not a significant factor after construction activities have been completed. Trees being removed are generally too small and infrequent to provide a significant sound barrier.

Air Movement: The number of trees proposed for removal will have little or no effect on the movement of air in this vicinity although removal of some larger Monterey pines will increase exposure of retained Monterey pines to wind.

Wildlife Habitat: Low impact for this parcel due to tree removal, which is very minor. Habitat connectivity from and between forested areas and other habitats remains viable both upslope and downslope after development as proposed.

Forest Management Agreement

The following standard conditions are required by the Monterey County Planning Department in Forest Management Plans and are applied whenever relevant to the project site and its trees.

Definitions

Forest Management Area (FMA). That portion of the subject parcel which is presently forested and lies beyond the immediate vicinity of the permitted building envelopes within this parcel.
Landmark tree. Any native tree more than 24" in diameter.
Significant tree. Any protected tree more than 6" in diameter.
Retained tree. Any significant tree not shown for removal on an approved final site plan.
Diameter. Thickness of main trunk of tree as measured 4'6" ("diameter at breast height or dbh") above the average ground surface at base of tree or lower, especially on oaks where trunk form permits measurement of a more representative stem diameter.
Dripline. The outer edge of the area beneath the crown of a tree.
Greenbelt. An area around the construction zone which, for purposes of fire protection, is kept free of highly flammable vegetation and is stabilized with green, growing plants.

Management Objectives

1) Minimize erosion (in order to prevent soil loss and siltation).

2) Preserve natural habitat (includes native oak forest, understory vegetation, and associated wildlife on site).

3) Prevent forest fire (i.e., uncontrolled fires.)

4) Preserve scenic forest canopy as located within any Critical Viewshed.

5) Preserve landmark trees.

Management Measures

Tree Removal. No protected tree shall be removed without a Forest Management Plan, an Amended Forest Management Plan, or a Permit where required by the County of Monterey, or unless diseased or hazardous or less than 12" and marked to improve forest health, as designated by a qualified forester.

Application Requirements. Where a Tree Removal Permit is required, trees proposed for removal will be conspicuously marked by flagging or paint. A site plan showing the location of each significant tree to be removed will accompany the application. If a substantial number of trees is requested for removal, they will generally be distributed over a wide area so that the overall unbroken appearance of the forest canopy is not altered.

Waiver of Permit Requirements. It is understood that the Director of the Monterey County Planning Department may waive the requirement to obtain a Tree Removal Permit in the following instances:

1) removal of diseased tree(s) which threaten to spread contagion to nearby healthy trees;
2) removal of dangerous tree(s) which present a clear and imminent threat to human life or property;
3) outside the FMA, removal of tree(s) where needed to allow construction of approved structures or roads.

Landmark Trees. All landmark trees will be protected from damage if not required to be removed under the above instances.

Dead Trees. Because of their great value for wildlife habitat (particularly as nesting sites for birds), large dead trees beyond the greenbelt will normally be left in place. Smaller dead trees will normally be removed in order to reduce fire hazard. Dead trees may be removed at the convenience of the owner, provided such removal is otherwise in conformance with this plan and designated by a qualified forester. Large dead trees may be removed from the greenbelt upon a finding of hazard or sufficient presence of this habitat element by a qualified forester. Dead trees, limbs, and other highly flammable material may be removed if required by Agency fire Officials, or as part of an approved Defensible Space Plan.

Thinning. Non-significant trees, where weak, diseased, or overcrowded, may be thinned to promote the growth of neighboring trees. Subject to the above permit requirements, significant trees may be removed for the same purpose. On a few portions of these parcels, stands of oaks are overcrowded with smaller trees. In such stands, thinning of trees up to 12" in diameter selected by a qualified forester or arborist is encouraged in order to promote growth of larger trees, increase understory diversity, and reduce fire hazard.

Replacement Trees. Where tree replacement is required, the appropriate replacement trees shall be planted in an area where they are free to grow, generally a clearing or gap between trees (preferably 30 feet or more between trunks), except where existing clearings are to be maintained. Exceptions will be made where a suitable seedling already exists, and in unforested garden and lawn areas. Every effort will be made to secure native seedlings rather than nursery stock of unknown origin. Coast live oak replacement trees should generally not be larger than 5 gallon size with one gallon preferred. Occasional use of larger planting stock, however, is acceptable to provide both visual and age diversity.

Protection of Trees. All significant and replacement trees, other than those approved for removal, shall be retained and maintained in good condition. Trimming, when not injurious to the health of the tree(s), may be performed wherever necessary in the judgment of the owner, particularly to reduce personal safety and fire hazards.
Retained trees which are located close to the construction site shall be protected from inadvertent damage by construction equipment through wrapping of trunks with protective materials, bridging or tunneling under major roots where exposed in the foundation or utility trenches, and other measures appropriate and necessary to protect the well-being of the retained trees (See Tree Care During Construction above).

Fire Prevention. In addition to any measures required by local or California Department of forestry fire authorities, owner will:

a. maintain spark arrester screen atop chimney;
b. maintain spark arresters on gasoline-powered equipment;
c. establish "greenbelt" by keeping vegetation around structure to a distance of 50 feet in a green, growing condition, and or controlling fuel accumulation in drought tolerant landscapes.
d. break up and clear away any dense accumulations of dead or dry underbrush or plant litter, especially near landmark trees and within greenbelt.

Use of Fire (for Clearing, Etc.). Open fires will be set or allowed within the FMA only as a forest management tool under the direction of Department of Forestry authorities, pursuant to local fire ordinances and directives.

Clearing Methods. Outside development areas, brush and other undergrowth, if removed, will be cleared through method(s) which will not materially disturb the ground surface. Hand grubbing, crushing, and mowing will normally be the methods of choice. Use of fire and herbicides will be subject to the limitations listed elsewhere in this Plan.
Areas laid bare by clearing, other than firebreaks, will be sown with a suitable erosion mix utilizing native grass and forb seeds as suitable and appropriate (if nothing else is to be planted in the area). Sowing of cleared areas will be completed prior to the onset of the winter rainy season.

Irrigation. In order to avoid further depletion of groundwater resources, prevent root disease, and otherwise maintain favorable conditions for the native oak forest, the FMA will not be irrigated except within the greenbelt area. Caution will be exercised to avoid overwatering around the trees within the greenbelt.

Exotic Plants. Care will be taken to eradicate on the four proposed parcels, and to avoid introduction of, the following pest species:

a. Pampas grass
b. Genista (Scotch broom, French broom)
c. Ecualyptus (large types).

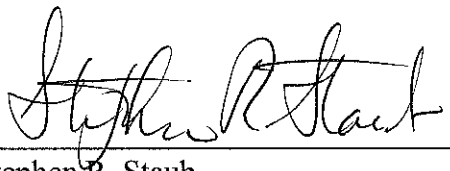
Amendments. It is understood that the Director of the Monterey County Planning Department, in consultation with the California Department of Forestry, may approve amendments to this Plan,

provided that such amendments are consistent with the provisions of the County Development Permit.

Compliance. It is further understood that failure to comply with this Plan will be considered failure to comply with the conditions of the County Development Permit.

Transfer of Responsibility. This Plan is intended to create a permanent forest management program for the site. It is understood, therefore, that in the event of change in ownership this Plan shall be as binding on the new owner(s) as it is upon the present owner. To this end, this Plan will be conveyed to the future owner upon sale of the property.

Hidden Forest Subdivision Management Plan Prepared by:



Stephen R. Staub
RPF #1911

10/19/06
Date

With major assistance from Bill Ruskin, RPF #2248

Appendix F

CNDDB Report

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Chittenden (3612185) OR Marina (3612167) OR Moss Landing (3612177) OR Natividad (3612165) OR Prunedale (3612176) OR Salinas (3612166) OR San Juan Bautista (3612175) OR Watsonville East (3612186) OR Watsonville West (3612187))
 AND Taxonomic Group IS (Fish OR Amphibians OR Reptiles OR Birds OR Mammals OR Mollusks OR Arachnids OR Crustaceans OR Insects OR Ferns OR Gymnosperms OR Monocots OR Dicots OR Lichens OR Bryophytes OR Fungi)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Actinemys marmorata northwestern pond turtle	ARAAD02031	Proposed Threatened	None	G2	SNR	SSC
Actinemys pallida southwestern pond turtle	ARAAD02032	Proposed Threatened	None	G2G3	SNR	SSC
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S2	SSC
Agrostis lacuna-vernalis vernal pool bent grass	PMPOA041N0	None	None	G1	S1	1B.1
Allium hickmanii Hickman's onion	PMLIL02140	None	None	G2	S2	1B.2
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Ambystoma macrodactylum croceum Santa Cruz long-toed salamander	AAAAA01082	Endangered	Endangered	G5T1T2	S2	FP
Aneides niger Santa Cruz black salamander	AAAAD01070	None	None	G3	S3	SSC
Anniella pulchra Northern California legless lizard	ARACC01020	None	None	G3	S2S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Aquila chrysaetos golden eagle	ABNKC22010	None	None	G5	S3	FP
Arctostaphylos andersonii Anderson's manzanita	PDERI04030	None	None	G2	S2	1B.2
Arctostaphylos hookeri ssp. hookeri Hooker's manzanita	PDERI040J1	None	None	G3T2	S2	1B.2
Arctostaphylos montereyensis Toro manzanita	PDERI040R0	None	None	G2?	S2?	1B.2
Arctostaphylos pajaroensis Pajaro manzanita	PDERI04100	None	None	G1	S1	1B.1
Arctostaphylos pumila sandmat manzanita	PDERI04180	None	None	G1	S1	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Asio flammeus short-eared owl	ABNSB13040	None	None	G5	S2	SSC
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G2G3	S1S2	
Bombus crotchii Crotch's bumble bee	IIHYM24480	None	Candidate Endangered	G2	S2	
Bombus occidentalis western bumble bee	IIHYM24252	None	Candidate Endangered	G3	S1	
Bombus pensylvanicus American bumble bee	IIHYM24260	None	None	G3G4	S2	
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Castilleja ambigua var. insalutata pink Johnny-nip	PDSCR0D403	None	None	G5T2	S2	1B.1
Castilleja rubicundula var. rubicundula pink creamsacs	PDSCR0D482	None	None	G5T2	S2	1B.2
Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1	None	None	G3T2	S2	1B.1
Charadrius nivosus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S3	SSC
Chorizanthe minutiflora Fort Ord spineflower	PDPGN04100	None	None	G1	S1	1B.2
Chorizanthe pungens var. pungens Monterey spineflower	PDPGN040M2	Threatened	None	G2T2	S2	1B.2
Chorizanthe robusta var. robusta robust spineflower	PDPGN040Q2	Endangered	None	G2T1	S1	1B.1
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1G2	S1S2	
Cordylanthus rigidus ssp. littoralis seaside bird's-beak	PDSCR0J0P2	None	Endangered	G5T2	S2	1B.1
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
Coturnicops noveboracensis yellow rail	ABNME01010	None	None	G4	S2	SSC
Danaus plexippus plexippus pop. 1 monarch - California overwintering population	IILEPP2012	Candidate	None	G4T1T2Q	S2	
Dicamptodon ensatus California giant salamander	AAAAH01020	None	None	G2G3	S2S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Dipodomys venustus venustus Santa Cruz kangaroo rat	AMAFD03042	None	None	G4T1	S1	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
Ericameria fasciculata Eastwood's goldenbush	PDAST3L080	None	None	G2	S2	1B.1
Eriogonum nortonii Pinnacles buckwheat	PDPGN08470	None	None	G2	S2	1B.3
Eryngium aristulatum var. hooveri Hoover's button-celery	PDAPI0Z043	None	None	G5T1	S1	1B.1
Eryngium montereyense Fort Ord button-celery	PDAPI0Z150	None	None	G1	S1	1B.1
Erysimum ammophilum sand-loving wallflower	PDBRA16010	None	None	G2	S2	1B.2
Erysimum menziesii Menzies' wallflower	PDBRA160R0	Endangered	Endangered	G1	S1	1B.1
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Euphilotes enoptes smithi Smith's blue butterfly	IILEPG2026	Endangered	None	G5T2	S2	
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Gilia tenuiflora ssp. arenaria Monterey gilia	PDPLM041P2	Endangered	Threatened	G3G4T2	S2	1B.2
Gonidea angulata western ridged mussel	IMBIV19010	None	None	G3	S2	
Helminthoglypta sequoicola consors redwood shoulderband	IMGASC2421	None	None	G2T1	S1	
Hoita strobilina Loma Prieta hoita	PDFAB5Z030	None	None	G2?	S2?	1B.1
Holocarpha macradenia Santa Cruz tarplant	PDAST4X020	Threatened	Endangered	G1	S1	1B.1
Horkelia cuneata var. sericea Kellogg's horkelia	PDROS0W043	None	None	G4T1?	S1?	1B.1
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Lasiurus cinereus hoary bat	AMACC05032	None	None	G3G4	S4	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lasthenia conjugens Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1
Lavinia exilicauda harengus Monterey hitch	AFCJB19013	None	None	G4T3	S3	SSC
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Microseris paludosa marsh microseris	PDAST6E0D0	None	None	G2	S2	1B.2
Microtus californicus halophilus Monterey vole	AMAFF11036	None	None	G5T1	S2	
Monardella sinuata ssp. nigrescens northern curly-leaved monardella	PDLAM18162	None	None	G3T2	S2	1B.2
Monolopia gracilens woodland woollythreads	PDAST6G010	None	None	G3	S3	1B.2
Neotoma macrotis luciana Monterey dusky-footed woodrat	AMAFF08083	None	None	G5T3	S3	SSC
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T3Q	S3	SSC
Oncorhynchus mykiss irideus pop. 9 steelhead - south-central California coast DPS	AFCHA0209H	Threatened	None	G5T2Q	S2	SSC
Optioservus canus Pinnacles optioservus riffle beetle	IICOL5E020	None	None	G2	S1	
Pedicularis dudleyi Dudley's lousewort	PDSCR1K180	None	Rare	G2	S2	1B.2
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G4	S4	SSC
Piperia yadonii Yadon's rein orchid	PMORC1X070	Endangered	None	G1	S1	1B.1
Plagiobothrys chorisianus var. chorisianus Choris' popcornflower	PDBOR0V061	None	None	G3T1Q	S1	1B.2
Plagiobothrys diffusus San Francisco popcornflower	PDBOR0V080	None	Endangered	G1Q	S1	1B.1
Puccinellia simplex California alkali grass	PMPOA53110	None	None	G2	S2	1B.2
Rallus obsoletus obsoletus California Ridgway's rail	ABNME05011	Endangered	Endangered	G3T1	S2	FP
Rana boylii pop. 4 foothill yellow-legged frog - central coast DPS	AAABH01054	Threatened	Endangered	G3T2	S2	
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Reithrodontomys megalotis distichlis Salinas harvest mouse	AMAFF02032	None	None	G5T1	S2	
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S3	
Rosa pinetorum pine rose	PDROS1J0W0	None	None	G1Q	S1	1B.2
Sorex ornatus salarius Monterey shrew	AMABA01105	None	None	G5T1T2	S1S2	SSC
Spea hammondii western spadefoot	AAABF02020	Proposed Threatened	None	G2G3	S3S4	SSC
Spirinchus thaleichthys longfin smelt	AFCHB03010	Proposed Endangered	Threatened	G5	S1	
Streptanthus albidus ssp. peramoenus most beautiful jewelflower	PDBRA2G012	None	None	G2T2	S2	1B.2
Taricha torosa Coast Range newt	AAAAF02032	None	None	G4	S4	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Trifolium buckwestiorum Santa Cruz clover	PDFAB402W0	None	None	G2	S2	1B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2	S2	
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S3	

Record Count: 93

Appendix G

IPaC Resource List

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

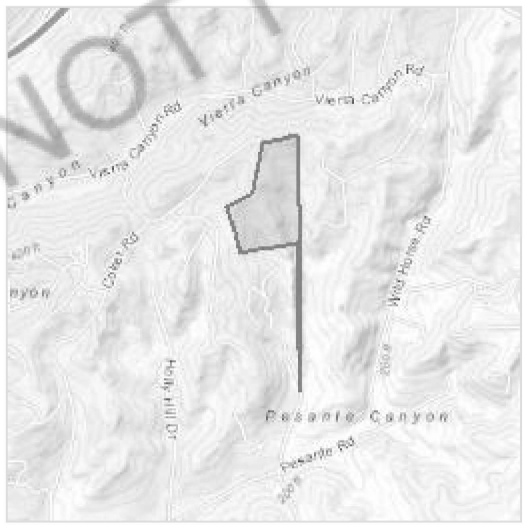
Project information

NAME

LaTourette Subdivision

LOCATION

Monterey County, California



DESCRIPTION

Some(Subdivision of a parcel and future develpment)

Local office

Ventura Fish And Wildlife Office

(805) 644-1766
(805) 644-3958
FW8VenturaSection7@FWS.Gov

2493 Portola Road, Suite B
Ventura, CA 93003-7726

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. 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

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Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
California Condor Gymnogyps californianus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8193	Endangered
California Ridgway''s Rail Rallus obsoletus obsoletus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4240	Endangered
Least Bell's Vireo Vireo bellii pusillus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5945	Endangered
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Northwestern Pond Turtle Actinemys marmorata Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened

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California Tiger Salamander Ambystoma californiense — Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/2076

Western Spadefoot Spea hammondii — Proposed Threatened

Wherever found

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/5425

Insects

NAME	STATUS

Monarch Butterfly Danaus plexippus — Candidate

Wherever found

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9743

Crustaceans

NAME	STATUS

Vernal Pool Fairy Shrimp Branchinecta lynchi — Threatened

Wherever found

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/498

Flowering Plants

NAME	STATUS

Marsh Sandwort Arenaria paludicola — Endangered

Wherever found

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/2229

Monterey Gilia Gilia tenuiflora ssp. arenaria — Endangered

Wherever found

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/856

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Monterey Spineflower Chorizanthe pungens var. pungens — Threatened
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/396

Santa Cruz Tarplant Holocarpha macradenia — Threatened
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/6832

Yadon's Piperia Piperia yadonii — Endangered
Wherever found
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
https://ecos.fws.gov/ecp/species/4205

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Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

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Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

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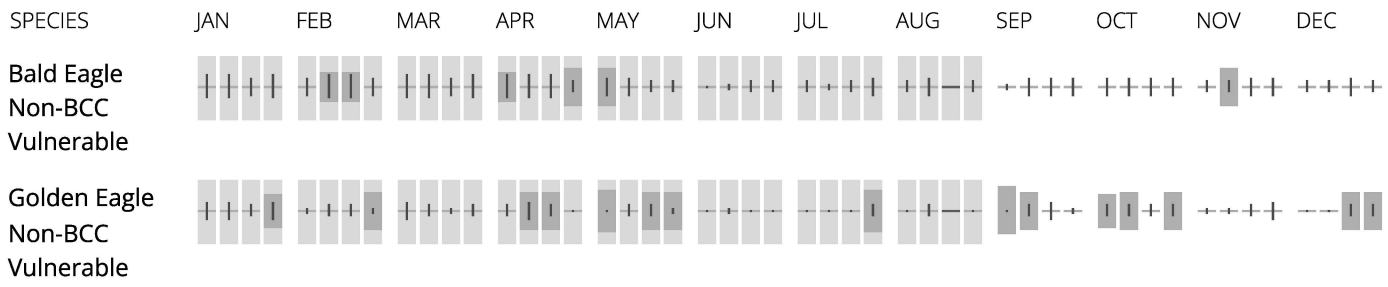

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

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Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15

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Bald Eagle Haliaeetus leucocephalus — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Belding's Savannah Sparrow Passerculus sandwichensis beldingi — Breeds Apr 1 to Aug 15

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8

Bullock's Oriole Icterus bullockii — Breeds Mar 21 to Jul 25

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

California Gull Larus californicus — Breeds Mar 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

California Thrasher Toxostoma redivivum — Breeds Jan 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Yellowthroat Geothlypis trichas sinuosa — Breeds May 20 to Jul 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/2084

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Spinus lawrencei — Breeds Mar 20 to Sep 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

NOT FOR CONSULTATION

Northern Harrier Circus hudsonius — Breeds Apr 1 to Sep 15
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/8350

Nuttall's Woodpecker Dryobates nuttallii — Breeds Apr 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Santa Barbara Song Sparrow Melospiza melodia graminea — Breeds Mar 1 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/5513

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Western Gull Larus occidentalis — Breeds Apr 21 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Western Screech-owl Megascops kennicottii cardonensis — Breeds Mar 1 to Jun 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

NOT FOR CONSULTATION

Yellow-billed Magpie Pica nuttalli — Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

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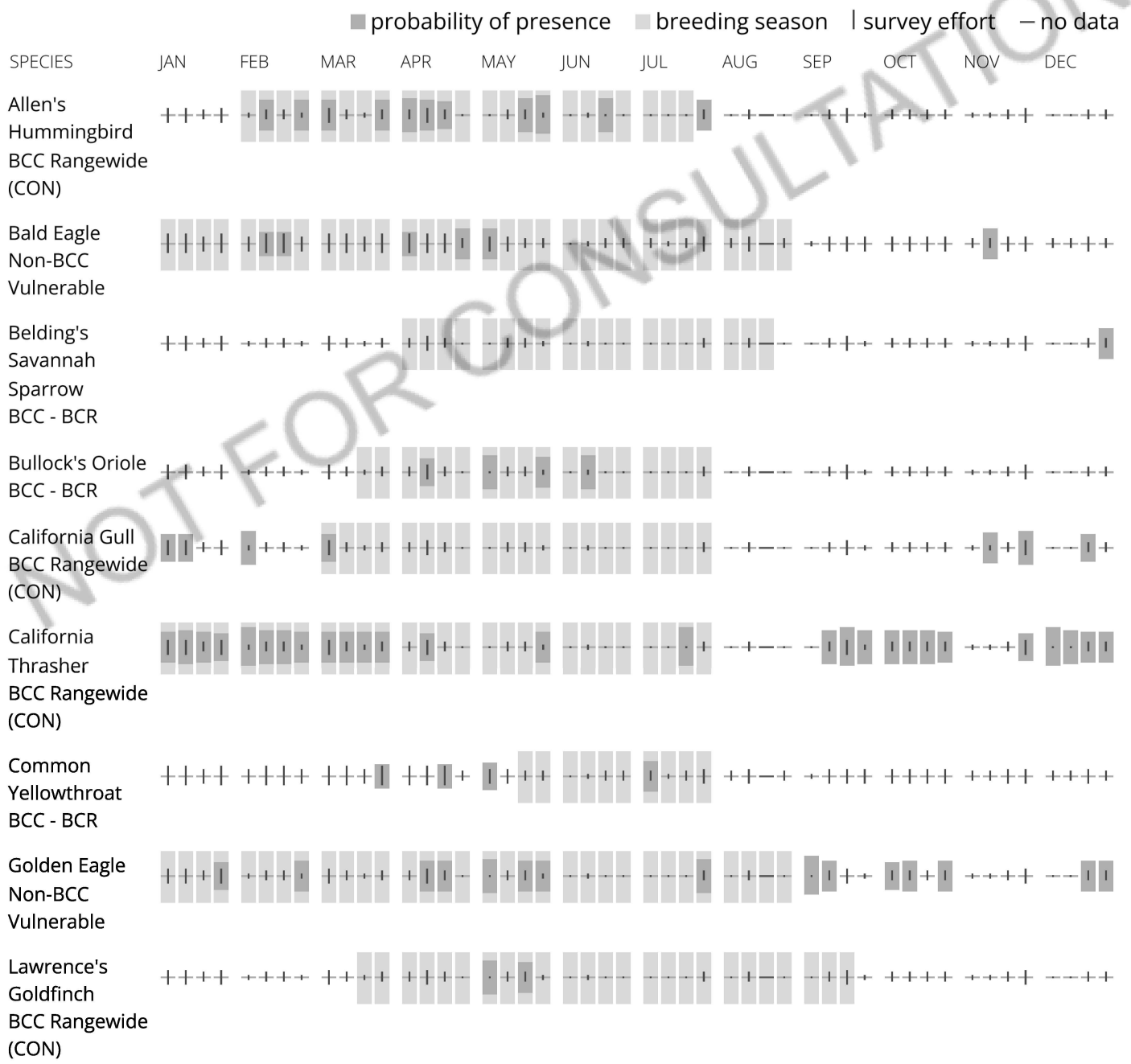
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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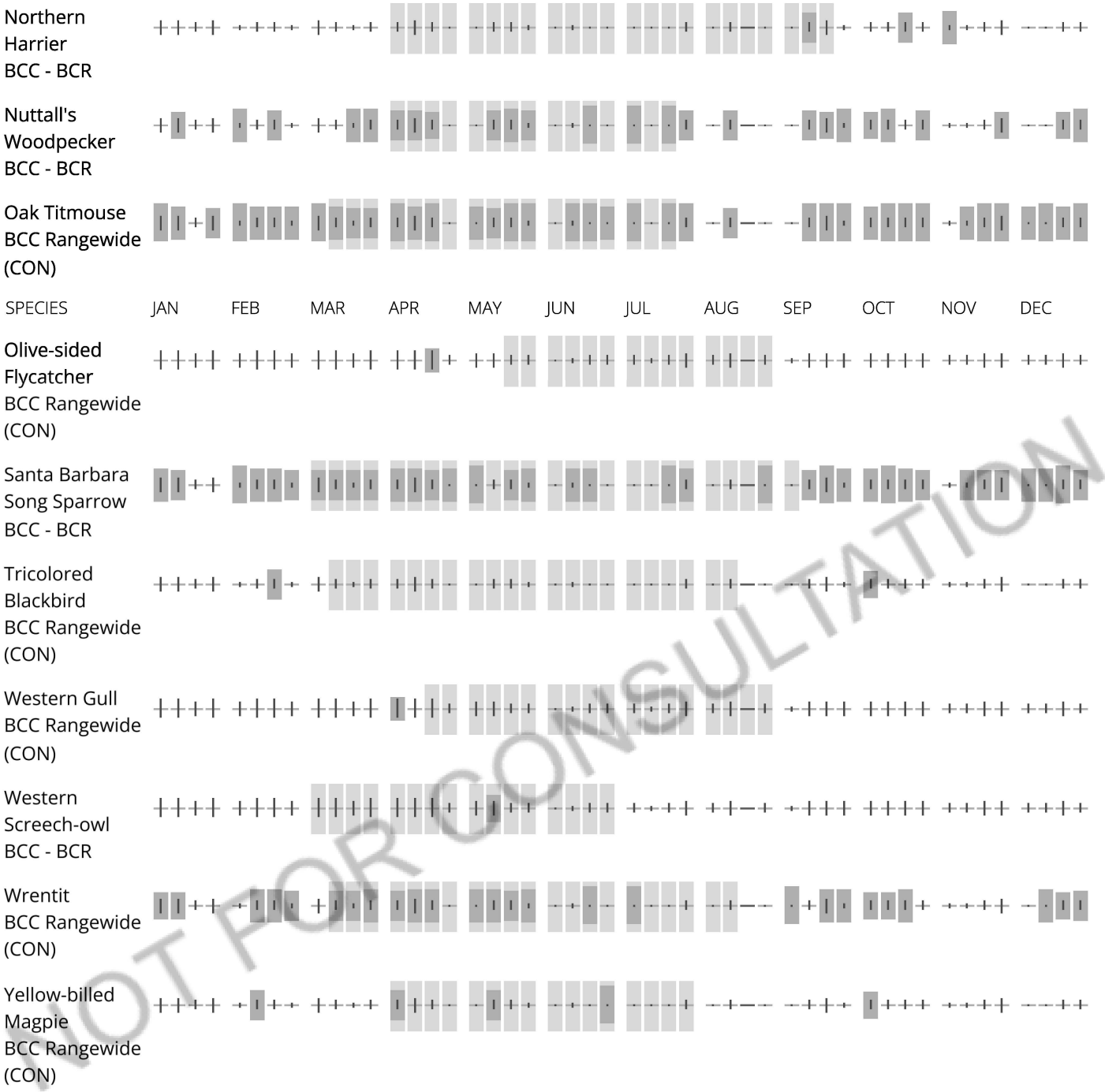

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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

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Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE

R4SBA

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

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The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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Appendix H

Species Table

Special-Status Species Table

USGS Quadrangles: Chittenden, Marina, Moss Landing, Natividad, Prunedale, Salinas, San Juan Bautista, Watsonville East, and Watsonville West.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
MAMMALS			
Antrozous pallidus Pallid bat	-- / CSC / --	Occurs in a wide variety of habitats including grasslands, shrublands, arid desert areas, oak savanna, coastal forested areas, and coniferous forests of the mountain regions of California. Most common in open, dry habitats with rocky areas for roosting. Day roosts include caves, crevices, mines, and occasionally hollow trees and buildings. Seems to prefer rocky outcrops, cliffs, and crevices with access to open habitats for foraging. Similar structures are used for night roosting and will also use more open sites such as eaves, awnings, and open areas under bridges for feeding roosts.	**Moderate** Foraging habitat is present. Trees and awnings and eaves of structures may provide night roost habitat. Suitable day roost habitat may be present in abandoned buildings within the project site. The nearest CNDDB occurrence is a 1949 specimen collection approximately 4 mi from the project site.
Corynorhinus townsendii Townsend's big-eared bat	-- / CSC / --	Found primarily in rural settings from inland deserts to coastal redwoods, oak woodland of the inner Coast Ranges and Sierra foothills, and low to mid-elevation mixed coniferous-deciduous forests. Typically roost during the day in limestone caves, lava tubes, and mines, but can roost in buildings that offer suitable conditions. Night roosts are in more open settings and include bridges, rock crevices, and trees.	**Moderate** Foraging habitat is present. Suitable day roost habitat may be present in abandoned buildings within the project site. Trees may provide night roost habitat. The nearest CNDDB occurrence is a 1990 observation located approximately 7.5 mi from the project site.
Neotoma macrotis luciana Monterey dusky-footed woodrat	-- / CSC / --	Forest and oak woodland habitats of moderate canopy with moderate to dense understory. Also occurs in chaparral habitats.	**Present** Nests of this species were observed within the project site during 2004-2019 biological surveys of the project site. Therefore, this species is assumed to be present within the site.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Puma concolor Mountain Lion (Southern California/Central Coast ESU)	-- / SC / --	Typically found in pine forest, riparian and oak woodlands, streams, chaparral, and grasslands; however, also use desert habitats. Require large areas of relatively undisturbed habitat with adequate connectivity to allow for dispersal and gene flow. Generally avoids areas with human disturbance.	**Moderate** The project site may provide suitable hunting and dispersal habitat; however, due to the level of human disturbance within and adjacent to the site, this species is unlikely to use to project site for denning. The CNDDB does not document occurrences of this species.
Sorex ornatus salarius Monterey shrew	-- / CSC / --	Mostly moist or riparian woodland habitats and within chaparral, grassland, and emergent wetland habitats where there is a thick duff or downed logs.	**Low** Marginal habitat is present within project site.
Taxidea taxus American badger	-- / CSC / --	Dry, open grasslands, fields, pastures savannas, and mountain meadows near timberline are preferred. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated grounds.	**Low** Marginal habitat is present within the project site; however, the project site is not contiguous with grasslands that support this species. The nearest CNDDB occurrence is a 2001 observation approximately 1.5 mi from the project site.
BIRDS			
Agelaius tricolor Tricolored blackbird (nesting colony)	-- / ST / --	Nest in colonies in dense riparian vegetation, along rivers, lagoons, lakes, and ponds. Forages over grassland or aquatic habitats.	**Not Present** Project site lacks specialized habitat features to support nesting for the species.
Aquila chrysaetos Golden eagle (nesting & wintering)	-- / CFP / --	Use rolling foothills, mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, cliffs, and rocky outcrops. Nest in secluded cliffs with overhanging ledges as well as large trees.	**Low** Trees within and adjacent to the project site may provide marginal nesting habitat. The nearest CNDDB occurrence is approximately 1.2 mi from the project site. Several eBird occurrences of this species are also reported in the Prunedale area.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Asio flammeus Short-eared owl (nesting)	-- / CSC / --	Usually found in open areas with few trees, such as annual and perennial grasslands, prairies, meadows, dunes, irrigated lands, and saline and freshwater emergent marshes. Dense vegetation is required for roosting and nesting cover. This includes tall grasses, brush, ditches, and wetlands. Open, treeless areas containing elevated sites for perching, such as fence posts or small mounds, are also needed. Some individuals breed in northern California.	**Low** Marginal habitat is present within the project site, as open areas are very limited. The nearest CNDDB occurrence is a 1977 observation located approximately 7.5 mi from the project site at the mouth of the Salinas River. eBird occurrences in the vicinity are limited to the Elkhorn Slough area.
Athene cunicularia Burrowing owl (burrow sites & some wintering sites)	-- / CSC / --	Year round resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. Frequent open grasslands and shrublands with perches and burrows. Use rodent burrows (often California ground squirrel) for roosting and nesting cover. Pipes, culverts, and nest boxes may be substituted for burrows in areas where burrows are not available.	**Low** Marginal habitat is present within the project site, as open areas are very limited. The nearest CNDDB occurrence is a 1983 observation of a group along the Salinas River approximately 4.4 mi from the project site. eBird occurrences in the vicinity are limited to the foothills east and south of Prunedale and the Elkhorn Slough area.
Charadrius nivosus nivosus Western snowy plover (nesting)	FT / CSC / --	Sandy beaches on marine and estuarine shores, also salt pond levees and the shores of large alkali lakes. Requires sandy, gravelly or friable soil substrate for nesting.	**Not Present** Project site lacks specialized habitat features to support the species.
Coturnicops noveboracensis Yellow rail	-- / CSC / --	Wet meadows and coastal tidal marshes. Occurs year round in California, but in two primary seasonal roles: as a very local breeder in the northeastern interior and as a winter visitor (early Oct to mid-Apr) on the coast and in the Suisun Marsh region	**Not Present** Project site lacks specialized habitat features to support the species.
Coccyzus americanus occidentalis Western yellow-billed cuckoo	FT / SE / --	Inhabits extensive deciduous riparian thickets or forests with dense, low-level or understory foliage, slow-moving watercourses, backwaters, or seeps. Willow almost always a dominant component of the vegetation.	**Not Present** Project site lacks specialized habitat features to support the species. The CNDDB does not report any occurrences of this species in the quadrangles evaluated.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Elanus leucurus White-tailed kite (nesting)	-- / CFP / --	Open groves, river valleys, marshes, and grasslands. Prefer such area with low roosts (fences etc.). Nest in shrubs and trees adjacent to grasslands.	**Moderate** Suitable habitat is present within the project site. The nearest CNDDB occurrence is a 2001 observation approximately 1.7 mi from the project site. Several eBird occurrences of this species are also reported in the Prunedale area.
Empidonax traillii extimus Southwestern willow flycatcher	FE / SE / --	Breeds in riparian habitat in areas ranging in elevation from sea level to over 2,600 meters. Builds nest in trees in densely vegetated areas. This species establishes nesting territories and builds, and forages in mosaics of relatively dense and expansive areas of trees and shrubs, near or adjacent to surface water or underlain by saturated soils. Not typically found nesting in areas without willows (*Salix sp*.), tamarisk (*Tamarix ramosissima*), or both.	**Not Present** Project site lacks specialized habitat features to support the species and is outside the currently known range. No occurrences of this species are reported in the CNDDB quadrangles reviewed and no eBird occurrences of this species are reported in Monterey County.
Gymnogyps californianus California condor	FE / SE / --	Roosting sites in isolated rocky cliffs, rugged chaparral, and pine covered mountains 2000-6000 feet above sea level. Foraging area removed from nesting/roosting site (includes rangeland and coastal area - up to 19-mile commute one way). Nest sites in cliffs, crevices, potholes.	**Not Present** Project site lacks specialized habitat features to support the species.
Lanius ludovicianus Loggerhead shrike	-- / CSC / --	Resident in dry open grasslands and agricultural areas. Scattered shrubs or trees, particularly thick or thorny species, serve as nesting substrates and hunting perches. Fences, utility wires, grasses, and forbs also may be used as perches.	**Moderate** Suitable habitat is present within the project site. The CNDDB does not report any occurrences of this species within the quadrangles reviewed; however, there are several eBird occurrences reported in the Prunedale area.
Rallus obsoletus obsoletus California Ridgway's rail	FE / SE&CFP / --	Salt and brackish marshes.	**Not Present** Project site lacks specialized habitat features to support the species.
Riparia riparia Bank swallow (nesting)	-- / ST / --	Nest colonially in sand banks. Found near water; fields, marshes, streams, and lakes.	**Not Present** Project site lacks specialized habitat features to support the species.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Vireo bellii pusillus Least Bell's vireo (nesting)	FE / SE / --	Riparian areas and drainages. Breed in willow riparian forest supporting a dense, shrubby understory. Oak woodland with a willow riparian understory is also used in some areas, and individuals sometimes enter adjacent chaparral, coastal sage scrub, or desert scrub habitats to forage.	**Unlikely** No suitable habitat within the project site. This species is a rare occurrence in the vicinity.
REPTILES AND AMPHIBIANS			
Actinemys marmorata Northwestern pond turtle	FC / CSC / --	Associated with permanent or nearly permanent water in a wide variety of habitats including streams, lakes, ponds, irrigation ditches, etc. Require basking sites such as partially submerged logs, rocks, mats of vegetation, or open banks. The range for this species is from Washington south to approximately Castroville, continuing into the foothills of the Salinas Valley from Salinas to Soledad, and then south into the central valley and eastern foothills to Lancaster, California.	**Unlikely** No suitable habitat within the project site.
Actinemys pallida Southwestern pond turtle	FC / CSC / --	Associated with permanent or nearly permanent water in a wide variety of habitats including streams, lakes, ponds, irrigation ditches, etc. Require basking sites such as partially submerged logs, rocks, mats of vegetation, or open banks. The range for this species is along the coast from Castroville to Baja California in Mexico, including the Salinas Valley to Soledad, the foothills west of the Central Valley to Lancaster, and the southern California mountain ranges.	**Not Present** Project site is outside of the currently known range for this species. No suitable habitat within the project site.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Ambystoma californiense California tiger salamander	FT / ST /--	Annual grassland and grassy understory of valley-foothill hardwood habitats in central and northern California. Need underground refuges and vernal pools or other seasonal water sources.	**Moderate** Suitable upland and dispersal habitat are present within the project site. No suitable breeding habitat is present within the site; however, a potential breeding pond is located less than 200 ft from the project site on an adjacent property. Multiple known CNDDB occurrences within 2.14 mi (2 km) of the project site, the nearest of which is a 2016 specimen located approximately 0.6 mi (0.9 km) from the project site. The nearest breeding occurrence is a 1990 occurrence reported approximately 0.8 mi (1.3 km) south of the project site.
Ambystoma macrodactylum croceum Santa Cruz long-toed salamander	FE / SE&CFP /--	Preferred habitats include ponderosa pine, montane hardwood-conifer, mixed conifer, montane riparian, red fir and wet meadows. Occurs in a small number of localities in Santa Cruz and Monterey Counties. Adults spend the majority of the time in underground burrows and beneath objects. Larvae prefer shallow water with clumps of vegetation.	**Unlikely** The project site is outside the known range of this species. No suitable breeding habitat is present within the project site and only limited suitable upland habitat is present.
Aneides niger Santa Cruz black salamander	-- / CSC /--	Endemic to California. Occurs in the fog belt of the outer Coastal Range in mesic forests. This species occurs in moist streamside microhabitats. This species is often found in shallow standing water or seeps. Small geographical range consisting of woodland habitat within the Santa Cruz Mountains in western Santa Clara, northern Santa Cruz, and southernmost San Mateo Counties.	**Not Present** The project site lacks the specialized habitat features to support this species. The project site is outside of the currently known range for this species.
Anniella pulchra California legless lizard	-- / CSC / --	Requires moist, warm habitats with loose soil for burrowing and prostrate plant cover, often forages in leaf litter at plant bases; may be found on beaches, sandy washes, and in woodland, chaparral, and riparian areas.	**Moderate** Suitable habitat is present within the project site where suitable conditions occur (e.g., suitable soils, leaf litter or duff below bushes and trees). The nearest CNDDB occurrence is approximately 4.4 mi from the project site.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Dicamptodon ensatus California giant salamander	-- / CSC / --	Endemic to California. Occurs within the Coast Range from just north of the southern border of Mendocino County to southern Santa Cruz County. Found in wet coastal forests in or around clear, cold permanent and semi-permanent streams and seepages. Typically within elevations ranging from sea level to approximately 3000 feet.	**Not Present** The project site lacks the specialized habitat features to support this species. The project site is outside of the currently known range for this species.
Phrynosoma blainvillii Coast horned lizard	-- / CSC / --	Associated with open patches of sandy soils in washes, chaparral, scrub, and grasslands.	**Moderate** Suitable habitat is present within the project site. The nearest CNDDB occurrence is a 2004 sighting located approximately 11 mi south of the project site in the City of Marina.
Rana boylii Foothill yellow-legged frog	FT / SE / --	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats, including hardwood, pine, and riparian forests, scrub, chaparral, and wet meadows. Rarely encountered far from permanent water.	**Not Present** Marginal upland habitat is present; however no suitable breeding habitat is present within the project site or within dispersal distance for this species.
Rana draytonii California red-legged frog	FT / CSC / --	Lowlands and foothills in or near permanent or late-season sources of deep water with dense, shrubby, or emergent riparian vegetation. During late summer or fall adults are known to utilize a variety of upland habitats with leaf litter or mammal burrows.	**Moderate** Suitable upland and dispersal habitat are present within the project site. No suitable breeding habitat is present within the site; however, a potential breeding pond is located less than 200 ft from the project site on an adjacent property. The nearest CNDDB occurrence is a 1990 breeding observation located approximately 0.7 mi from the project site within a spring-fed pond.
Spea hammondii Western spadefoot	-- / CSC / --	Grasslands with shallow temporary pools are optimal habitats for the western spadefoot. Occur primarily in grassland habitats, but can be found in valley and foothill woodlands. Vernal pools are essential for breeding and egg laying.	**Not Present** The project site lacks the specialized habitat features to support this species.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Taricha torosa Coast Range newt (Monterey County south only)	-- / CSC / --	Occurs mainly in valley-foothill hardwood, valley-foothill hardwood-conifer, coastal scrub, and mixed chaparral but is known to occur in grasslands and mixed conifer types. Seek cover under rocks and logs, in mammal burrows, rock fissures, or man-made structures such as wells. Breed in intermittent ponds, streams, lakes, and reservoir.	**Moderate** Suitable upland and dispersal habitat are present within the project site. No suitable breeding habitat is present within the site; however, a potential breeding pond is located less than 200 ft from the project site on an adjacent property. The nearest known CNDDB occurrence is a 2001 observation of 500 breeding adults located approximately 1.2 mi from the project site.
FISH			
Eucyclogobius newberryi Tidewater goby	FE / CSC / --	Brackish water habitats, found in shallow lagoons and lower stream reaches. Tidewater gobies appear to be naturally absent (now and historically) from three large stretches of coastline where lagoons or estuaries are absent and steep topography or swift currents may prevent tidewater gobies from dispersing between adjacent localities. The southernmost large, natural gap occurs between the Salinas River in Monterey County and Arroyo del Oso in San Luis Obispo County.	**Not Present** The project site lacks the specialized habitat features to support this species.
Lavinia exilicauda harengus Monterey hitch	-- / CSC / --	Found only within the Pajaro and Salinas River systems. Can occupy a wide variety of habitats, however, they are most abundant in lowland areas with large pools or small reservoirs that mimic such conditions. May be found in brackish water conditions within the Salinas River lagoon during the early summer months when the sandbar forms at the mouth of the river.	**Not Present** The project site lacks the specialized habitat features to support this species.
Oncorhynchus mykiss irideus Steelhead (Central California Coast DPS)	FT / -- / --	Coastal perennial and near perennial streams, with suitable spawning and rearing habitat and no major barriers. Found from the Russian River to and including Aptos Creek, and all drainages of San Francisco and San Pablo Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers.	**Not Present** The project site lacks the specialized habitat features to support this species and is outside of the range for this species.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Oncorhynchus mykiss irideus Steelhead (south/central California coast DPS)	FT / -- / --	Cold headwaters, creeks, and small to large rivers and lakes; anadromous in coastal streams. Found in streams and rivers from the Pajaro River in Santa Cruz County to (but not including) the Santa Maria River in San Luis Obispo County.	**Not Present** The project site lacks the specialized habitat features to support this species.
Spirinchus thaleichthys Longfin smelt	-- / ST&CSC / --	Euryhaline, nektonic & anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefers salinities of 15-30 PPT, but can be found in completely freshwater to almost pure seawater. Found in coastal estuaries north of the Russian River (primarily in Humbolt Bay) and south of Pillar Point in Half Moon Bay.	**Not Present** The project site lacks the specialized habitat features to support this species.
INVERTEBRATES			
Bombus crotchii Crotch bumble bee	-- / SC / --	Occurs in open grassland and scrub at relatively warm and dry sites. Requires plants that bloom and provide adequate nectar and pollen throughout the colony's life cycle, which is from early February to late October. Generally nests underground, often in abandoned mammal burrows. Within California this species is known to occur in the Mediterranean, Pacific Coast, Western Desert, as well as Great Valley and adjacent foothill regions.	**Moderate** The project site is within the historic range of this species; however, it is outside of the currently known range as shown on CDFW's Biogeographic Information and Observation System. Suitable foraging and nesting habitat is present within project site. The presence of grassland and chaparral habitats likely indicate that adequate nectar and pollen resources are available throughout a colony's lifecycle.
Bombus occidentalis Western bumble bee	-- / SC / --	Occurs in open grassy areas, urban parks, urban gardens, chaparral, and meadows. This species generally nests underground. Western bumble bee populations are currently largely restricted to high elevation sites in the Sierra Nevada.	**Moderate** The project site is within the historic range of this species; however, it is outside of the currently known range as shown on CDFW's Biogeographic Information and Observation System. Suitable foraging and nesting habitat is present within project site. The presence of grassland and chaparral habitats likely indicate that adequate nectar and pollen resources are available throughout a colony's lifecycle.
Branchinecta lynchi Vernal pool fairy shrimp	FT / -- / --	Require ephemeral pools with no flow. Associated with vernal pool/grasslands from near Red Bluff (Shasta County), through the central valley, and into the South Coast Mountains Region.	**Not Present** No suitable habitat within the project site.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Danaus plexippus Monarch butterfly	FC / -- / --	Overwinters in coastal California using colonial roosts generally found in Eucalyptus, pine and acacia trees. Overwintering habitat for this species within the Coastal Zone represents ESHA. Local ordinances often protect this species as well.	**Low** The eucalyptus and Monterey pine trees within the project site are likely not dense enough to provide protection from the wind. No overwintering occurrences are known within the project site.
Euphilotes enoptes smithi Smith's blue butterfly	FE / -- / --	Most commonly associated with coastal dunes and coastal sage scrub plant communities in Monterey and Santa Cruz Counties. Plant hosts are *Eriogonum latifolium* and *E. parvifolium*.	**Not Present** No suitable habitat within the project site. The obligate host plants were not identified within the project sit during previous biological surveys.
PLANTS			
Agrostis lacuna-vernalis Vernal pool bent grass	--/--/1B	Vernal pool mima mounds at elevations of 115-145 meters. Annual herb in the Poaceae family; blooms April-May. Known only from Butterfly Valley and Machine Gun Flats of Ft. Ord National Monument.	**Not Present** The project site lacks the specialized habitat features to support this species and is outside of the currently known range.
Allium hickmanii Hickman's onion	-- / -- / 1B	Closed-cone coniferous forests, maritime chaparral, coastal prairie, coastal scrub, and valley and foothill grasslands at elevations of 5-200 meters. Bulbiferous perennial herb in the Alliaceae family; blooms March-May.	**Moderate** Suitable habitat is present within the project site. The nearest CNDDB occurrence is located approximately 10.5 mi from the project site.
Arctostaphylos andersonii Anderson's manzanita	-- / -- / 1B	Openings and edges of broadleaved upland forest, chaparral, and north coast coniferous forest at elevations of 60-760 meters. Evergreen shrub in the Ericaceae family; blooms November-May.	**Present** This species was observed during focused rare plant surveys conducted between 2004 and 2016.
Arctostaphylos hookeri ssp. *hookeri* Hooker's manzanita	-- / -- / 1B	Closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub on sandy soils at elevations of 85-536 meters. Evergreen shrub in the Ericaceae family; blooms January-June.	**Present** This species was observed during focused rare plant surveys conducted between 2004 and 2016.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Arctostaphylos montereyensis Toro manzanita	-- / -- / 1B	Maritime chaparral, cismontane woodland, and coastal scrub on sandy soils at elevations of 30-730 meters. Evergreen shrub in the Ericaceae family; blooms February-March.	**Unlikely** Suitable habitat is present within the project site; however, the project site is likely outside of the range for this species, which is restricted to the former Fort Ord and immediately surrounding area. The nearest CNDDB occurrence is located approximately 10.5 mi from the project site.
Arctostaphylos pajaroensis Pajaro manzanita	-- / -- / 1B	Chaparral on sandy soils at elevations of 30-760 meters. Evergreen shrub in the Ericaceae family; blooms December-March.	**Present** This species was observed during focused rare plant surveys conducted between 2004 and 2016.
Arctostaphylos pumila Sandmat manzanita	-- / -- / 1B	Openings of closed-cone coniferous forests, maritime chaparral, cismontane woodland, coastal dunes, and coastal scrub on sandy soils at elevations of 3-205 meters. Evergreen shrub in the Ericaceae family; blooms February-May.	**Present** This species was observed during focused rare plant surveys conducted between 2004 and 2016.
Arenaria paludicola Marsh sandwort	FE / SE / 1B	Known from only two natural occurrences in Black Lake Canyon and at Oso Flaco Lake. Sandy openings of freshwater of brackish marshes and swamps at elevations of 3-170 meters. Stoloniferous perennial herb in the Caryophyllaceae family; blooms May-August.	**Not Present** The project site lacks the specialized habitat features to support this species. The project site is outside the known range of this species.
Astragalus tener var. *tener* Alkali milk-vetch	-- / -- / 1B	Playas, valley and foothill grassland on adobe clay, and vernal pools on alkaline soils at elevations of 1-60 meters. Annual herb in the Fabaceae family; blooms March-June.	**Unlikely** No suitable habitat within the project site. Project site is above the elevation range for this species.
Castilleja ambigua var. insalutata Pink johnny-nip	-- / -- / 1B	Coastal prairie and coastal scrub at elevations of 0-100 meters. Annual herb in the Orobanchaceae family; blooms May-August.	**Unlikely** No suitable habitat within the project site.
Castilleja rubicundula var. *rubicundula* Pink creamsacs	-- / -- / 1B	Openings in chaparral, cismontane woodlands, meadows and seeps, and valley and foothill grasslands on serpentinite soils, at elevations of 20-910 meters. Annual herb in the Orobanchaceae family; blooms April-June.	**Unlikely** Marginal habitat is present within the project site; however, no serpentine soils are present within the project site.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Centromadia parryi ssp. *congdonii* Congdon's tarplant	-- / -- / 1B	Valley and foothill grassland on heavy clay, saline, or alkaline soils at elevations of 0-230 meters. Annual herb in the Asteraceae family; blooms May-November.	**Low** Marginal habitat is present within the project site; however, soils are unlikely to support this species.
Chorizanthe minutiflora Fort Ord spineflower	-- / -- / 1B	Sandy openings of maritime chaparral and coastal scrub at elevations of 55-150 meters. Only known occurrences on Fort Ord National Monument. Annual herb in the Polygonaceae family; blooms April-July.	**Unlikely** Suitable habitat is present within the project site; however, the project site is outside the known range of this species.
Chorizanthe pungens var. *pungens* Monterey spineflower	FT / -- / 1B	Maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland on sandy soils at elevations of 3-450 meters. Annual herb in the Polygonaceae family; blooms April-July.	**High** Suitable habitat is present within the project site. The nearest CNDDB occurrence is reported less than 0.3 mi from the project site.
Chorizanthe robusta var. *robusta* Robust spineflower	FE / -- / 1B	Openings in cismontane woodland, coastal dunes, maritime chaparral, and coastal scrub on sandy or gravelly soils at elevations of 3-300 meters. Annual herb in the Polygonaceae family; blooms April-September.	**Unlikely** Marginal habitat is present within the project site; however, the project site is likely outside the current range of this species.
Cordylanthus rigidus ssp. *littoralis* Seaside bird's-beak	-- / SE / 1B	Closed-cone coniferous forests, maritime chaparral, cismontane woodlands, coastal dunes, and coastal scrub on sandy soils, often on disturbed sites, at elevations of 0-425 meters. Annual hemi-parasitic herb in the Orobanchaceae family; blooms April-October.	**Moderate** Suitable habitat is present within the project site. The nearest CNDDB occurrence is reported approximately 5.6 mi from the project site.
Ericameria fasciculata Eastwood's goldenbush	-- / -- / 1B	Openings in closed-cone coniferous forest, maritime chaparral, coastal dunes, and coastal scrub on sandy soils at elevations of 30-275 meters. Evergreen shrub in the Asteraceae family; blooms July-October.	**High** Suitable habitat is present within the project site. Several CNDDB occurrences of this species are reported within 1,000 ft the project site.
Eriogonum nortonii Pinnacles buckwheat	-- / -- / 1B	Chaparral and valley and foothill grassland on sandy soils, often on recent burns, at elevations of 300-975 meters. Annual herb in the Polygonaceae family; blooms May-September.	**Unlikely** Suitable habitat is present within the project site; however, the project site is outside the known elevation range of this species.
Eryngium aristulatum var. hooveri Hoover's button-celery	-- / -- / 1B	Vernal pools at elevations of 3-45 meters. Annual/perennial herb in the Apiaceae family; blooms June-August.	**Not Present** The project site lacks the specialized habitat features to support this species. Project site is above the elevation range for this species.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Eryngium montereyense Fort Ord button-celery	-- / -- / 1B	Vernal moist swales and vernal pools in valley and foothill grassland surrounded by maritime chaparral and coast live oak woodland on marine sedimentary substrate. In the Apiaceae family; blooms April-July.	**Not Present** The project site lacks the specialized habitat features to support this species.
Erysimum ammophilum Sand-loving wallflower	-- / -- / 1B	Openings in maritime chaparral, coastal dunes, and coastal scrub on sandy soils at elevations of 0-60 meters. Perennial herb in the Brassicaceae family; blooms February-June.	**Unlikely** Suitable habitat is present within the project site; however, the project site is above the elevation range for this species. The nearest CNDDB occurrence is reported approximately 8.7 mi from the project site along the coast.
Erysimum menziesii Menzies' wallflower	FE / SE / 1B	Coastal dunes at elevations of 0-35 meters. Perennial herb in the Brassicaceae family; blooms March-September.	**Not Present** The project site lacks the specialized habitat features to support this species. Project site is outside of the known range for this species.
Fritillaria liliacea Fragrant fritillary	-- / -- / 1B	Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland, often serpentinite, at elevations of 3-410 meters. Bulbiferous perennial herb in the Liliaceae family; blooms February-April.	**Low** Marginal habitat is present within the project site; however, suitable soils are not present.
Gilia tenuiflora ssp. *arenaria* Monterey gilia	FE / ST / 1B	Openings in maritime chaparral, cismontane woodland, coastal dunes, and coastal scrub on sandy soils at elevations of 0-45 meters. Annual herb in the Polemoniaceae family; blooms April-June.	**Unlikely** Suitable habitat is present within the project site; however, the project site is above the elevation range for this species.
Hoita strobilina Loma Prieta hoita	-- / -- / 1B	Mesic areas of chaparral, cismontane woodland, and riparian woodland, usually on serpentinite soils, at elevations of 30-860 meters. Perennial herb in the Fabaceae family; blooms May-October.	**Unlikely** Marginal habitat may be present; however, serpentine soils are not present within the project site.
Holocarpha macradenia Santa Cruz tarplant	FT / SE / 1B	Coastal prairies and valley foothill grasslands, often clay or sandy soils, at elevations of 10-220 meters. Annual herb in the Asteraceae family; blooms June-October.	**Unlikely** Marginal habitat is present within the project site; however, the project site is likely outside of the range for this species.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Horkelia cuneata var. sericea Kellogg's horkelia	-- / -- / 1B	Openings of closed-cone coniferous forests, maritime chaparral, coastal dunes, and coastal scrub on sandy or gravelly soils at elevations of 10-200 meters. Perennial herb in the Rosaceae family; blooms April-September.	**Moderate** Suitable habitat is present within the project site. The nearest CNDDB occurrence is reported approximately 10 mi from the project site along the coast.
Horkelia marinensis Point Reyes horkelia	-- / -- / 1B	Coastal dunes, coastal prairie, and coastal scrub on sandy soils at elevations of 5-350 meters. Perennial herb in the Rosaceae family; blooms May-September.	**Unlikely** No suitable habitat within the project site.
Lasthenia conjugens Contra Costa goldfields	FE / -- / 1B	Mesic areas of valley and foothill grassland, alkaline playas, cismontane woodland, and vernal pools at elevations of 0-470 meters. Annual herb in the Asteraceae family; blooms March-June.	**Unlikely** No suitable habitat within the project site.
Legenere limosa Legenere	-- / -- / 1B	Vernal pools and wetlands at elevations of 1-880 meters. Annual herb in the Campanulaceae family; blooms April- June.	**Unlikely** No suitable habitat within the project site.
Microseris paludosa Marsh microseris	-- / -- /1B	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland at elevations of 5-300 meters. Perennial herb in the Asteraceae family; blooms April-July.	**Moderate** Suitable habitat is present within the project site. The nearest CNDDB occurrence is reported approximately 19 km from the project site.
Monardella sinuata ssp. *nigrescens* Northern curly-leaved monardella	-- / -- / 1B	Chaparral, coastal dunes, coastal scrub, and lower montane coniferous forest (ponderosa pine sandhills) on sandy soils at elevations of 0-300 meters. Annual herb in the Lamiaceae family; blooms April-September.	**Moderate** Suitable habitat is present within the project site. The nearest CNDDB occurrence is reported approximately 11.8 mi from the project site.
Monolopia gracilens Woodland woollythreads	-- / -- / 1B	Openings of broadleaved upland forest, chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland on serpentinite soils at elevations of 100-1200 meters. Annual herb in the Asteraceae family; blooms February-July.	**Unlikely** Suitable habitat may be present; however, serpentine soils are not present within the project site.
Pedicularis dudleyi Dudley's lousewort	-- / SR / 1B	Maritime chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland at elevations of 60-900 meters. Perennial herb in the Orbanchaceae family; blooms April-June.	**Moderate** Suitable habitat is present within the project site. The nearest CNDDB occurrence is reported approximately 18 mi from the project site.

Species	Status (Service/ CDFW/CNPS)	General Habitat	Potential Occurrence within Project Site
Piperia yadonii Yadon's rein orchid	FE / -- / 1B	Sandy soils in coastal bluff scrub, closed-cone coniferous forest, and maritime chaparral at elevations of 10-510 meters. Annual herb in the Orchidaceae family; blooms February-August.	**Present** This species was observed during focused rare plant surveys conducted between 2004 and 2016.
Plagiobothrys chorisianus var. *chorisianus* Choris's popcorn-flower	-- / -- / 1B	Mesic areas of chaparral, coastal prairie, and coastal scrub at elevations of 15-160 meters. Annual herb in the Boraginaceae family; blooms March-June.	**Moderate** Suitable habitat is present within the project site. The nearest CNDDB occurrence is reported approximately 7.5 mi from the project site.
Plagiobothrys diffusus San Francisco popcorn-flower	-- / SE / 1B	Coastal prairie and valley and foothill grassland at elevations of 60-360 meters. Annual herb in the Boraginaceae family; blooms March-June.	**Low** Marginal habitat is present within the project site; however, this species is not known to occur as far inland as the project site.
Puccinellia simplex California alkali grass	-- / -- / 1B	Valley and foothill grasslands, chenopod scrub, meadows and seeps, and vernal pools. Found in alkaline, vernally mesic; sinks, flats, and lake margins. Occurs at elevations of 2-930 meters. Annual herb in the Poaceae family; blooms March-May.	**Unlikely** No suitable habitat within the project site.
Rosa pinetorum Pine rose	-- / -- / 1B	Closed-cone coniferous forest at elevations of 2-300 meters. Perennial shrub in the Rosaceae family; blooms May-July. Possible hybrid of *R. spithamea*, *R. gymnocarpa*, or others; further study needed.	**Unlikely** No suitable habitat within the project site. Pine trees within the project site are planted and do not represent natural habitat.
Streptanthus albidus ssp. *peramoenus* Most beautiful jewel-flower	-- / -- / 1B	Chaparral, cismontane woodlands, and valley and foothill grasslands on serpentinite soils at elevations of 94-1000 meters. Annual herb in the Brassicaceae family; blooms March-October.	**Unlikely** Suitable habitat may be present; however, serpentine soils are not present within the project site.
Trifolium buckwestiorum Santa Cruz clover	-- / -- / 1B	Gravelly margins of broadleaved upland forest, cismontane woodland, and coastal prairie at elevations of 105-610 meters. Annual herb in the Fabaceae family; blooms April-October.	**Unlikely** No suitable habitat within the project site.
Trifolium hydrophilum Saline clover	-- / -- / 1B	Marshes and swamps, mesic and alkaline valley and foothill grassland, and vernal pools at elevations of 0-300 meters. Annual herb in the Fabaceae family; blooms April-June.	**Moderate** The detention basin within the project site may provide suitable habitat. The nearest CNDDB occurrences are reported approximately 7.5 mi from the project site.

STATUS DEFINITIONS

Federal

FE = listed as Endangered under the federal Endangered Species Act
FT = listed as Threatened under the federal Endangered Species Act
FC = Candidate for listing under the federal Endangered Species Act
-- = no listing

State

SE = listed as Endangered under the California Endangered Species Act
ST = listed as Threatened under the California Endangered Species Act
SC = Candidate for listing under California Endangered Species Act
SR = plants listed as Rare under the California Native Plant Protection Act
CFP = California Fully Protected Species
CSC = CDFW Species of Concern
-- = no listing

California Native Plant Society

1B = California Rare Plant Rank 1B species; plants rare, threatened, or endangered in California and elsewhere
-- = no listing

POTENTIAL TO OCCUR

Present = observed during field surveys; or recent, known occurrence of species within the site (excluding non-specific occurrences not attributed to the site) and presence of suitable habitat conditions
High = known occurrence of species in the immediate vicinity; presence of suitable habitat conditions
Moderate = known occurrence of species in the vicinity; presence of suitable habitat conditions
Low = known occurrence of species in the vicinity; presence of marginal habitat conditions
Unlikely = species not known to occur in the vicinity, no suitable habitat conditions
Not Present = species was not observed during surveys; or site lacks specialized habitat features to support the species

Appendix I

Geotechnical Report

VOLUME ONE
PRELIMINARY GEOLOGIC AND GEOTECHNICAL REPORT
FOR
LA TOURETTE, A RESIDENTIAL SUBDIVISION
MONTEREY COUNTY, CALIFORNIA

Prepared For
DENISE DUFFY & ASSOCIATES
Monterey, California

Prepared By
HARO, KASUNICH AND ASSOCIATES, INC.
Geotechnical & Coastal Engineers
NOLAN, ZINN AND ASSOCIATES
Engineering Geologists
HKA Project No. M8633
NZA Project No. 04045-MT
September 2004

HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

HKA Project No. M8633
NZA Project No. 04045-MT
15 September 2004

Mr. Jeff Foster
Denise Duffy & Associates
947 Cass Street, Suite 5
Monterey, California 93940

Subject: Geologic and Geotechnical Feasibility Study

Reference: La Tourette, A Residential Subdivision
Monterey County, California

Dear Mr. Foster:

In accordance with your request, we have performed a preliminary geologic and geotechnical feasibility study for the proposed La Tourette Subdivision, a residential subdivision project in northern Monterey County, California.

This study outlines the geologic and geotechnical earth material characteristics and potential geologic hazards. To understand the process of selecting the least impacted areas for development, it is important to understand the general geology of the area, particularly the distribution of old buried soil horizons contained within the ancient dune field that underlies the subject property. This report presents a description of the general geology of the area, the seismic impact considerations that need to be evaluated, and presents a brief discussion of the potential consequences resulting from potential geologic and geotechnical hazards.

We refer you to the enclosed text and accompanying roll of plates for a detailed discussion. The plates are attached separately; however it is important to note that this report should be considered incomplete without them.

We appreciate the opportunity to be of service to you on this interesting and challenging project. If you have any questions concerning the data or conclusions presented in this report, please call our office.

Very truly yours,

HARO, KASUNICH & ASSOCIATES, INC.
NOLAN, ZINN & ASSOCIATES, INC.

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HKA Project No. M8633
NZA Project No. 04045-MT
15 September 2004

TABLE OF CONTENTS

LETTER OF TRANSMITTAL

EXECUTIVE SUMMARY 1

GEOLOGIC AND GEOTECHNICAL FEASIBILITY LA TOURETTE SUBDIVISION 5

INTRODUCTION 5
Proposed Development 6

SCOPE OF INVESTIGATION 7
REGIONAL GEOLOGIC SETTING 8
REGIONAL SEISMIC SETTING 10
San Andreas Fault 10
Zayante-(Vergeles Fault 13
LOCAL SETTING 14
Topography 14
Tentative Proposed Grading 15
Drainage 15
Groundwater 16
Local Geologic Setting 17
General Surface Soil Conditions 19
Engineering Evaluation and Properties of the Subsoils 20
Engineering Properties of Fill Soils 21
Surficial Soil Conditions 21
Liquefaction and Lateral Spreading Hazards 22
Landsliding 25
Erosion 26
Seismic Shaking Hazard 26
TABLE 1, Modified Mercalli Intensity Scale 27
Deterministic Seismic Shaking Analysis 28
TABLE 2 Faults, Earthquakes and Deterministic Seismic Shaking Data 29
Flooding 32
Cut/Fill Transitions 32
Expansive Soil 33
Groundwater 34
Surficial Stability 34
Detention Ponds & Water Features 35
Sewage Treatment 36

CONTINUED TABLE OF CONTENT

General Grading Considerations....36
Rough Grading....37
POTENTIAL GEOLOGIC AND GEOTECHNICAL IMPACTS....38
Grading Considerations....38
Fill Embankment Toe Keys and Benching....39
Building Code Seismic Information....39

CONCLUSIONS....40

RECOMMENDATIONS....44
General Recommendations....44
Table 2 Faults, Earthquakes and Deterministic Seismic Shaking Data....45

LIMITATIONS AND UNIFORMITY OF CONDITIONS....49

REFERENCES....51
Aerial Photographs....51
Maps and Reports....51

VOLUME TWOAPPENDICES FOR GEOLOGIC AND GEOTECHNICAL FEASIBILITY STUDYFOR LA TOURETTE, A RESIDENTIAL SUBDIVISION....56

APPENDIX A....57
Site Vicinity Map....58
Regional Geologic Map....59
Regional Seismicity Map....60
Topographic Index Map....61
Local Geologic Map....62
Local Liquefaction Susceptibility Map....63
Field Exploration....64
Soil Classification Chart....66
Logs of Test Borings....67
Laboratory Testing Program....79
Plasticity Chart....80
Grain Size Distribution....81
Direct Shear Test Results....97
Geologic Site Map & Cross-Section, Plate 1....100

APPENDIX B....101
HAZARDS AND ACCEPTABLE RISKS....102

HKA Project No. M8633
NZA Project No. 04045-MT
15 September 2004

EXECUTIVE SUMMARY

This report presents the findings and conclusions of the preliminary geologic and geotechnical feasibility study for the proposed La Tourette Subdivision, a residential development project in Monterey County, California. Geological Hazards and Geotechnical aspects of the project were evaluated in accordance with the guidelines for geologic/seismic reports contained in the California Division of Mines and Geology (CDMG) Notes 42 and 44. Our investigation also addresses in general, geotechnical issues of the site.

We conclude the proposed residential project is feasible with proper implementation of mitigation measures and further geologic/geotechnical investigations. Further investigation and more detailed recommendations will be required to address specific issues during design phases for each of the lots.

Based upon the investigation described in this report, we drew the following conclusions regarding geological hazards:

1. Surface Fault Rupture: Negligible hazard since the nearest known active or potentially active fault is at least 2.7 kilometers away.

2. Liquefaction and Lateral Spreading: Low if any potential exists. Minor potential would be along the drainages, where high groundwater and loose soil conditions prevail.

3. Landsliding: No landslide deposits or scars were observed upon the existing native slopes on the property. Hence, it is our opinion that the potential is low for landsliding to occur upon existing native slopes within the lifetime of the proposed development. Grading for the proposed development may create an unnatural condition that is unstable, so it is important that slope stability be maintained at acceptable levels by use of appropriate engineering solutions during development. In this case, given mass grading is limited not only for the infrastructure but the individual lots these areas require further study.

4. Erosion: Accelerated erosion resulting in the formation of rills and gullies can be a significant problem in the sandy soils present upon the rolling hills terrain on the property. However, this potential problem can, in our opinion, be mitigated with appropriate engineering solutions. Strict erosion control maintenance programs will be an important post-construction requirement for this development.

5. Seismic Ground Motion: Strong ground shaking is to be expected at this site during a major earthquake in keeping with the seismicity of the area.

6. Flooding: Minor potential in the project location.

Geotechnical issues related to the proposed development are:

1. Cut/Fill Transitions: This issue is significant where proposed improvements (i.e. buildings) straddle cut/fill transitions and/or can be influenced by it. Mitigation measures include reworking the impacted building envelopes, relocation to offset the transitions, foundation types that account for site conditions, and other appropriate engineering solutions.
2. Expansive Soil: Expansive soils are considered to be a minor potential issue. However, where expansive soils (fat clays) are encountered, mitigation measures can include removal and design of special foundation types.
3. Foundations: On the basis of the preliminary findings, structures conceivably can be supported upon conventional spread footing systems. However, there will be areas in which other types of foundation design are more appropriately suited i.e. cast-in-place pier and grade beam foundation system, mat-type foundations and other suited foundation systems.
4. Erosion and Runoff Control: Soil erosion and runoff control is a significant geotechnical-related development issue. Mitigation measures via appropriate engineering solutions can be taken into account during the final plan development phases of this project.

5. Settlement: Settlement can be a significant issue for this project. Although, the nature of the in-situ earth materials (sandy soils) are such that settlement due to the proposed overburden loading condition will take place over relative short term period usually as the loading takes place, some post construction compression is likely. The most significant compression will take place in the thickest fill areas.

The following report presents the basis of these and other itemized conclusions. First, a description of the regional geological setting provides the background for the discussion of the local geology and site conditions. Then, seismicity and site ground motion are presented within this context, followed by geological hazards of concern, together with corresponding mitigation measures and/or recommendations for further study. A summary of the investigation methods, including the existing site data, site reconnaissance, exploratory borings, aerial photo interpretation and mapped slope conditions, completes the report.

HKA Project No. M8633
NZA Project No. 04045-MT
15 September 2004

GEOLOGIC AND GEOTECHNICAL FEASIBILITY STUDY
LA TOURETTE SUBDIVISION
MONTEREY COUNTY, CALIFORNIA

INTRODUCTION

This report presents the results of the preliminary geologic and geotechnical feasibility analysis for the proposed La Tourette Subdivision, a residential subdivision located in northern Monterey County, California. Our professional services were performed in accordance with the scope of services outlined under Exhibit A of the contract, dated 26 July 2004 and addendum thereto. The formal project title is "La Tourette Subdivision" and preliminary drawings, titled "Vesting Tentative Map", dated 28 March 2002 (MCS Inc, Job No. 20061) show the proposed lot layout. We have used this map as a base map for this study.

We have performed a preliminary feasibility analysis for the proposed subdivision. Our objectives for this phase of the project were to gain a general overview of geotechnical and geologic conditions for the 48 (±) acre property, in order to provide feasibility level conclusions and recommendations for the proposed development. The primary focus of our investigation was to identify geotechnical and geologic issues affecting the project and summarize areas of specific concern to be studied in more detail at future phases of the project. We have attempted to identify portions of the proposed development which may be subject to geotechnical or geologic "fatal flaws" such as areas underlain by geologic

hazards which pose severe risks to the development which may be economically prohibitive to mitigate.

It is assumed that the recommended subsurface exploration and quantitative analyses outlined in the recommendations section of this report will be performed to confirm the preliminary conclusions, considering that our study is a feasibility-level investigation. Our scope of work for this investigation *does not* provide for site-specific design recommendations or quantitative conclusions for the proposed development. This work should be done at later pre-design or design phases when the specific development plan, including detailed grading plans, has been firmly determined and plotted on suitably-scaled base maps.

We obtained the following documents for this project:

An electronic copy of "La Tourette Subdivision - Vesting Tentative Map" by Monterey County Surveyors, Inc., dated 28 March 2002.

Proposed Development

On the basis of the La Tourette Subdivision, Vesting Tentative Map prepared by Monterey County Surveyors, Inc., undated, it is indicated the project is to consist of nineteen (19)

single family residential lots with public improvements to provide ingress and egress into the subdivision:

The tentative map indicates this project is to be sold by lots, undeveloped, with the initial phase comprised of the public improvements.

To accomplish the proposed infrastructure mass grading of moderate proportions is being proposed. We understand approximately 5,400 cubic yards of earth material will be moved for this phase of the project. Cuts and fills heights are not shown on the tentative map, making it impossible for us to issue site-specific design criteria for the proposed grading scheme.

SCOPE OF INVESTIGATION

Work performed during this study included:

1. A review of regional geotechnical and geologic literature pertinent to the subject property and available consultant□s reports, as described above.

2. Review of available information from previous studies pertinent to the proposed development.

3. Examination and interpretation of five sets of vertical stereo aerial photographs.

4. Field reconnaissance of the proposed 48 acre parcel by the Project Geologist and Project Geotechnical Engineer

5. Deterministic seismic hazards analysis.

6. Construction of draft geologic maps and cross sections. These maps are included with this report as Plates 1 and 2.

7. Analysis and interpretation of the data and preparation of this draft report.

The study focused only upon the feasibility aspects of the project. As such, our findings are preliminary and general in nature. Our scope of services specifically excludes a detailed, site specific geologic hazards analysis, geologic subsurface investigation, and quantitative analysis of slope stability, liquefaction, lateral spreading and Some of these tasks should be performed in the future as part of the pre-design and design phases of the project.

REGIONAL GEOLOGIC SETTING

The subject property lies on the southeastern fringe of the Watsonville lowlands, where they onlap onto the western flank of the Gabilan Range, in the central portion of the Coast Ranges physiographic province of California. This portion of the Coast Ranges is formed

by a series of rugged, linear ridges and valleys following the pronounced northwest to southeast structural grain of central California geology. The Gabilan Range is mostly underlain by a large, elongate prism of granitic and metamorphic basement rocks, known collectively as the Salinian Block. These rocks are separated from contrasting basement rock types to the northeast and southwest by the San Andreas and San Gregorio-Nacimiento strike-slip fault systems, respectively. Overlying the granitic basement rocks is a sequence of dominantly marine sedimentary rocks of Paleocene to Pliocene age and non-marine sediments of Pliocene to Pleistocene age (Figure 1).

Throughout the Cenozoic Era, this portion of California has been dominated by tectonic forces associated with lateral or "transform" motion between the North American and Pacific lithospheric plates, producing long, northwest-trending faults such as the San Andreas and San Gregorio, with horizontal displacements measured in tens to hundreds of miles. Accompanying the northwest direction of the horizontal (strike-slip) movement of the plates have been episodes of compressive stress, reflected by repeated episodes of uplift, deformation, erosion and subsequent redeposition of sedimentary rocks. Along the coast, the ongoing tectonic activity is most evident in the formation of a series of uplifted marine and fluvial terraces. The Loma Prieta earthquake of 1989 is the most recent reminder of the geologic unrest in the region.

The Quaternary history of the Watsonville lowlands has been dominated by fluvial, marine and eolian deposition because the central Monterey Bay region has been relatively stable, while the northern and southern Monterey Bay region has been tectonically uplifted. The earth materials in the vicinity of the subject property are mostly fluvial and alluvial fan sediments graded to one or more Sangamon highstands of sea level (Dupré; 1975a & b, 1990; Dupré and Tinsley, 1980).

REGIONAL SEISMIC SETTING

California's broad system of strike-slip faulting has had a long and complex history. Some of these faults present a seismic hazard to the proposed development. The most important of these are the San Andreas and Zayante (-Vergeles) faults (Figure 1). These faults are either active or considered potentially active (Cao et al., 2003) Each fault is discussed below. Locations of epicenters associated with the faults are shown in Figure 2. The intensity of seismic shaking that could occur at the proposed development in the event of a future earthquake on one of these faults will be discussed in a later section.

San Andreas Fault

The San Andreas fault is active and represents the major seismic hazard in northern California (WGONCEP, 1996). The main trace of the San Andreas fault trends northwest-southeast and extends over 700 miles from the Gulf of California through the Coast Ranges to Point Arena, where the fault extends offshore.

Geologic evidence suggests that the San Andreas fault has experienced right-lateral, strike-slip movement throughout the latter portion of Cenozoic time, with cumulative offset of hundreds of miles. Surface rupture during historical earthquakes, fault creep, and historical seismicity confirm that the San Andreas fault and its branches, the Hayward, Calaveras, and San Gregorio faults, are all active today.

Historical earthquakes along the San Andreas fault and its branches have caused significant seismic shaking in the Monterey County area. The two largest historical earthquakes on the San Andreas to affect the area were the moment magnitude (M_w) 7.9 San Francisco earthquake of 18 April 1906 (actually centered near Olema) and the M_w 6.9 Loma Prieta earthquake of 17 October 1989. The San Francisco earthquake caused severe seismic shaking and structural damage to many buildings in Monterey County. The Loma Prieta earthquake appears to have caused more intense seismic shaking than the 1906 event in localized areas of the nearby Santa Cruz Mountains, even though its regional effects were not as extensive. There were also significant earthquakes in northern California along or near the San Andreas fault in 1838, 1865 and possibly 1890 (Sykes and Nishenko, 1984; WGONCEP, 1996).

Geologists have recognized that the San Andreas fault system can be divided into segments with "characteristic" earthquakes of different magnitudes and recurrence intervals (Working Group On California Earthquake Probabilities, 1988 and 1990). A study

by the Working Group On Northern California Earthquake Potential (WGONCEP) in 1996 has redefined the segments and the characteristic earthquakes for the San Andreas fault system in northern and central California. Two "locking" overlapping segments and one creeping segment of the San Andreas fault system represent the greatest potential hazard to the subject property.

The nearest segment of the San Andreas fault, dubbed the "creeping zone" segment by the WGONCEP (1996), runs roughly between the town of San Juan Bautista and the Carrizo Plains. This segment is treated as fully creeping by the WGONCEP (1996) and is considered to be adequately modeled with background seismicity events no greater than M_w 6.

The overlapping locking segments are located slightly north of the subject property. The first segment is defined by the rupture that occurred from the Mendocino triple junction to San Juan Bautista along the San Andreas fault during the great M_w 7.9 earthquake of 1906. The WGONCEP (1996) has hypothesized that this "1906 rupture" segment experiences earthquakes with comparable magnitudes in independent cycles about two centuries long.

The second segment is defined by the rupture zone of the M_w 6.9 Loma Prieta earthquake, despite the fact that the oblique slip and focal depth of this event do not fit the typical, right-

lateral strike-slip event on the San Andreas fault. Although it is uncertain whether this "Santa Cruz Mountains" segment has a characteristic earthquake independent of great San Andreas fault earthquakes, the WGONCEP (1996) has assumed an "idealized" earthquake of M_w 7.0 with the same right-lateral slip as the 1989 Loma Prieta earthquake, but having an independent segment recurrence interval of 138 years and a multi-segment recurrence interval of 400 years.

Zayante (-Vergeles) Fault

The Zayante fault lies west of the San Andreas fault and trends about 50 miles northwest from the Watsonville lowlands into the Santa Cruz Mountains. The southern extension of the Zayante fault, known as the Vergeles fault, merges with the San Andreas fault south of San Juan Bautista.

The Zayante fault has a long, well-documented history of vertical movement (Clark and Reitman, 1973), probably accompanied by right-lateral, strike-slip movement (Hall et al., 1974; Ross and Brabb, 1973). Stratigraphic and geomorphic evidence indicates the Zayante fault has undergone late Pleistocene and Holocene movement and is potentially active (Buchanan-Banks et al., 1978; Coppersmith, 1979).

Some historical seismicity may be related to the Zayante fault (Griggs, 1973). For instance, the Zayante fault may have undergone sympathetic fault movement during the 1906

earthquake centered on the San Andreas fault, although this evidence is equivocal (Coppersmith, 1979). Seismic records strongly suggest that a section of the Zayante fault approximately 3 miles long underwent sympathetic movement in the 1989 earthquake. The earthquake hypocenters tentatively correlated to the Zayante fault occurred at a depth of 5 miles; no instances of surface rupture on the fault have been reported.

In summary, the Zayante fault should be considered potentially active. The WGONCEP (1996) considers it capable of generating a magnitude 6.8 earthquake with an effective recurrence interval of 10,000 years.

LOCAL SETTING

Topography

The proposed subdivision shown on Figure 3 and Plate 1 lies within an area dominated by gentle rolling hills with occasional steep to moderately steep flanks, cut by several broad, flat-bottomed drainages, and numerous narrow side hill drainage swales. The side hill swales drain into the larger, flat-bottomed drainages. The two large flat- bottomed drainages drain south, intersecting with one another off-site at the base of the hill approximately 0.4 mile or near Pesante Road (Figure 3). Portions of the rolling hills have been extensively disked. Wild grasses and stands of pines, oak trees and madrone making up the balance of the ground cover. Elevations of the ridge crests range up to 480 feet above mean sea level (Figure 3 and Plate 1).

Tentative Proposed Grading

The Vesting Tentative Map prepared by Monterey County, Surveyors, Inc. provides a broad overview of the proposed grading. Mass grading for the 48 acre project will be in the order of 5,400 cubic yards for the proposed infrastructure. Cut/fill proportions are not indicated on the map provided to us, and are thus unknown at the time of this study.

Drainage

Most of the natural surface drainage on the subject property primarily occurs by overland sheet flow, in all directions, and is eventually captured by the large flat-bottomed drainages (Figure 3 and Plate 1). Drainage within the flat-bottomed drainages ranges from being naturally meandering to focus in gullies and man-made drainages. One small pond has been constructed across the flat-bottomed drainage on the property, although its effectiveness at retaining water appears to be limited, due to the high transmissivity of the underlying sediments and dam faces. The majority of surface drainage is eventually funneled toward the southern edge of the property via the two flat-bottomed drainages, eventually intersecting the drainage of Pesante Canyon. The south flowing flat-bottomed drainage near the north end of the property continues southward into Woodland Heights an adjacent subdivision.

It is important to note that rills and gullies can develop rapidly in this region when modified by works of man, due to the terrain and the high erosivity of the underlying earth materials, particularly when the top soil is disturbed, or when drainage is collected and improperly discharged in a concentrated fashion.

The source of the surface water on the property in the winter is primarily from rainfall, but household-related irrigation is the primary surface water source during the drier spring, summer and fall seasons.

Groundwater

We did not perform an exhaustive investigation of current regional groundwater table elevations across the property. We presume that ground water isn't much higher than mean sea level, since salt water intrusion into the local groundwater basin is problematic along the coastline in this area. The presence of perched ground water due to irrigation and seasonal rainfall is more germane to the geologic and geotechnical hazards that pose risks to the proposed development.

Perched ground water may be seasonally present within the large, flat-bottomed drainages due to irrigation and rainfall. Perched ground water was encountered approximately eight feet below the ground surface in Boring No. 1, which was drilled in the area of a proposed pond. Perched ground water may also be seasonally present in the rolling hills terrain, due

to percolating water from irrigation and rainfall "hanging up" on relatively impermeable clay or silt strata or paleosols (also informally referred to as "claypan" or "hardpan"). Intense irrigation or a wetter than average rainfall season will only serve to elevate these seasonally perched ground water levels even higher.

Local Geologic Setting

The subject property is located near the southeastern fringe of the Watsonville Lowlands, a nominally subsiding basin dominated by river deposition in conjunction with fluctuating sea levels, caused by cycles of continental glaciation, for about the last one million years. This interplay has given rise to a series of river deposits interlayered with and overlain by sand dune and marine terrace deposits. The most detailed regional geologic mapping in the Watsonville Lowlands region has been performed by Dupré and Tinsley (1980, see Plate 3), and our following descriptions of the earth materials and their distribution on the property closely follows the work performed by them.

The property appears to be underlain by the mid-Quaternary age Aromas Sand, a sequence of fluvial and dune sediments. The Aromas Sand is a heterogeneous sequence of relatively well consolidated eolian and fluvial sand, silt, clay and gravel. Dupré and Tinsley (1980) portray the property as being almost entirely underlain by the eolian deposit subdivision of the Aromas Sand, with a small sliver of alluvial deposits in the southeastern corner of the property.

This is in partial agreement with the results of our exploratory small diameter boring program and our field reconnaissance. The entire property appears to be underlain by the eolian deposit subdivision of the Aromas Formation, with "fingers" of surficial deposits derived from the Aromas Formation, called Colluvium, filling the two south-trending drainage swales (see Plate 1). The Colluvium is at least 19 feet deep within the swale along the eastern edge of the property, as illustrated by boring log B-1.

The eolian deposits are comprised of fine to medium grained, well sorted sand containing varying amounts of silt and clay. Some clay rich horizons were encountered at various depths across the property. These horizons are likely old soil horizons, called paleosols, marking a stable period in the life of the sand dune, long enough to allow development of a pedogenic soil horizon, prior to renewed movement of the dune field and subsequent burial of the former dune surface and palesol. Since the paleosols mirror the topography of the former dune surface, their distribution through the subsurface is impossible to predict with a scattering of small diameter borings because of the undulatory complexity and haphazard lateral distribution of individual dune fields. Total thickness of the eolian deposits in the vicinity of the property appears to be in excess of several hundred feet, based upon our inspection of the geological produced by Dupré and Tinsley (1980).

The colluvium filling the drainage swales is comprised of very loose to loose, well sorted fine to medium grained sand containing varying amounts silt. The composition of the

colluvium is similar to the eolian deposits because it is derived from them. Total thickness of the colluvium in the swales is at least 20 feet and possibly deeper, based upon the results from boring B-1.

No landslide deposits were mapped by Dupré and Tinsley (1980) (see Figure 4). We did not observe any evidence of landslide deposits or scars during our aerial photograph analysis and reconnaissance of the property.

There are sundry wedges of artificial fill associated with road grading and farming operations (?) at various locations on the property. Furthermore, it appears that the soil across some portions of the property have been ripped and disturbed as part some former clearing operations. We did not perform a detailed evaluation of the condition of the fill deposits.

Other than grading associated with the various roads, we observed no evidence of large-scale grading on the property.

General Surface Soil Conditions

The earth materials near the ground surface are subject to surficial weathering that produces soils of distinct character based on age, type of parent material, slope conditions and other factors. The U.S. Department of Agriculture (USDA) Soil Conservation Service

has produced agricultural soil surveys for the study area. These surveys generally pertain to near-surface materials within the upper 6 feet or so of the ground surface and should not be used as a predictive tool for forecasting the types of surface soils one may encounter during excavation on the property.

It has been our experience that the stratigraphy of the underlying parent earth materials is so complex, particularly within eolian deposits with buried and exposed paleosols, that the surface soils often significantly deviate from those predicted by the USDA maps.

Engineering Evaluation and Properties of the Subsoils

Results of particle size analysis performed on selective samples indicate that it contains approximately 78 percent sand size particles and 22 percent fines consisting of silt-clay size particles, on a dry weight basis. A selective sample that visually appeared to be a fat clay was used to determine an Atterberg Limits. The sample tested indicate the fines show a low to moderate plasticity characteristic and typically would be classified as having a low expansion potential. On the basis of the data from the on-site samples tested and those compiled from nearby sites the typical index and engineering properties of the subsoils are as follows:

a. Index Properties

- Moisture content (w) = 11 % ± 17 %
- Total unit weight (γ_t) = 128 pcf ± 16 pcf

- Dry unit weight (γ_d) = 108 pcf
- Soil classification: plastic silty sand. (As noted, the fines content is a mixture of silty-clay size particles)

b. Engineering Properties

- Shear strength on the basis of Standard Penetration resistance and complied shear strength (Direct shear test) data: friction angle (φ) = 33 °, cohesion intercept (c) = 400 psf. These values are typical and not necessarily indicative of site specific areas.

Engineering Properties of Fill Soils

At some locations of the property there is manmade fill that overlies the in situ topsoils. This manmade fill is highly variable, consisting of basically sand with silt and clay size particles with differing proportions of each soil type at each different location. We also noted in some locations that fragments of claypan or hardpan (paleosols) were scattered throughout the fill. These soils will need to be removed together with loose top soils across the development. It is conceivable these soils can be replaced as engineered fill.

Surficial Soil Conditions

Where the land has been cleared of vegetation, it also has been disked and/or plowed . By this process, the top soils have been highly disturbed and very loose soil conditions exist

within one or more feet of the top soils. These soils will need to be reprocessed and compacted to help minimize soil erosion.

Liquefaction and Lateral Spreading Hazards

The physical process of seismically induced liquefaction has been documented by numerous researchers (Youd, 1973; Seed and Idriss, 1982; National Research Council, 1985). During an earthquake seismic waves travel through the earth and vibrate the ground. In cohesionless, granular materials having low relative density (loose sands for example), this vibration can disturb the particle framework, thus leading to increased compaction of the material and reduction of pore space between the framework grains. If the sediment is saturated, water occupying the pore spaces resists this compaction and exerts pore pressure that reduces the contact stress between the sediment grains. With continued shaking, transfer of intergranular stress to pore water can generate pore pressures great enough to cause the sediment to lose its strength and change from a solid state to a liquefied state. This mechanical transformation can cause various kinds of ground failure at or near the ground surface.

The liquefaction process typically occurs at depths less than 50 feet below the ground surface. Liquefaction can occur at deeper intervals, given the right conditions, however ground manifestations should be minor. The most susceptible zone occurs at depths shallower than 30 feet below the ground surface. Diminished susceptibility with increase in

depth can be attributed mainly to two factors: 1) increased overburden pressure resulting from the load of overlying sediment layers, and 2) increased geologic age. These two factors tend to create a denser packing of sediment grains in the deeper sedimentary materials, which thus are less likely to experience the additional compaction and elevated pore pressures that are necessary to induce loss of shear strength and liquefaction during an earthquake.

Liquefaction can lead to several types of ground failure, depending on slope conditions and the geologic and hydrologic setting (Seed, 1968; Youd, 1973; Tinsley et al, 1985). The four most common types of ground failure are: 1) lateral spreads, 2) flow failures, 3) ground oscillation and 4) loss of bearing strength. Sand boils (injections of fluidized sediment) commonly accompany these different types of ground failure and form sand volcanoes at the ground surface or convolute layering and sand dikes in subsurface sediment layers.

Detailed studies of different earthquakes and associated liquefaction events (Lawson, 1908; Youd and Hoose, 1978; Tinsley and Dupré, 1992; Obermeier, 1989; Ziony, 1985; Youd and Wieczorek, 1982; Muir and Scott, 1982) has shown the following:

The different types of ground failure associated with liquefaction often leave geomorphic evidence after the event in the form of scarps, and open (or infilled) ground cracks, and sand volcanoes. This type of evidence can be readily observed via site reconnaissance or

aerial photo analysis on undisturbed ground long after the liquefaction has occurred. However, if the ground surface is disturbed, such as by subsequent agricultural activity, the ground information is erased. We did not observe evidence of differential settlement, lurch cracking or lateral spreading on the subject property during our aerial photo analysis or our reconnaissance. However, any evidence of past liquefaction may have been obscured by cultural activities on the property.

It is unknown whether liquefaction or lateral spreading occurred within the Basin Deposits on the subject property during the 1989 Loma Prieta earthquake. We hasten to add, however, that the 1989 earthquake occurred after a string of drought years, and the resulting intensity and duration of seismic shaking was lower than that which occurred in 1906. Hence, the 1989 earthquake may not be the "acid test" for the potential susceptibility of liquefaction in this area. No record of liquefaction related damage was reported as a result of the 1906 earthquake in the Youd and Hoose summary (1978) or by Lawson (1908), but the population and anecdotal reports were so sparse in this region in 1906, it is possible that any damage sustained on the subject property during the 1906 earthquake could have gone unnoticed.

The bulk of the subject property has been characterized by Dupré and Tinsley (1980) as having a "low susceptibility" to liquefaction (see Figure 5), with the exception of a small finger of deposits near the southeastern corner of the property mapped as being of

"moderate susceptibility" to liquefaction. This finger of slightly elevated liquefaction susceptibility corresponds to the area mapped as alluvial deposits by Dupré and Tinsley (1980) (see Figure 5) and mapped as colluvium by us (see Plate 1). Regardless of the interpretation or the genesis of the earth materials, it is our opinion that the very loose to loose sand encountered in boring B-1 may liquefy if subjected to intense seismic shaking when saturated. Although a detailed evaluation was not performed on the aforementioned data, our preliminary opinion is that the potential for liquefaction to occur within the lifetime of the development is moderate for the areas underlain by colluvium, and low for the balance of the property, based upon the site conditions. This conclusion is based upon the relative density of the in-situ soils encountered in the exploratory borings advanced within the colluvium, and the presence of of perched shallow groundwater (at the time our exploratory borings were advanced).

Landsliding

As discussed in an earlier section, we did not observe any evidence of landslide deposits or scars on the property during aerial photo analysis or field reconnaissance. In our opinion, the potential for landsliding to occur on the native slopes is low for the lifetime of the proposed development. However, it is important to note that relative slope stability issues may arise in the future, depending upon the further decisions being made about the proposed grading scheme for the subdivision, as well as for grading that occurs on

individual lots. It is important for this issue to be revisited and carefully studied in regard to the forthcoming detailed grading plans.

Erosion

Severe erosion is common in the sandy soils present upon the rolling hills terrain in this region, particularly where the natural drainage is modified by the works of man and not properly controlled. Typically, once the upper surface of the weathered sandy earth materials is breached by a rill or a gully, erosion proceeds at an accelerated rate, and the rills and gullies deepen and migrate headward (upslope). This process may significantly impact the proposed development if existing rills and gullies aren't mitigated, and if any of the proposed drainage controls are not adequately designed and constructed. The Civil Engineers that develop the grading plans will need to address this issue by providing erosion control measures, such as, energy dissipaters, lined ditches, catch basins, etc. that will reduce the potential of accelerated erosion. Provisions for maintenance will be a requirement in development of this property during and past construction.

Seismic Shaking Hazard

Seismic shaking on the property will be intense during the next major earthquake along one of the local fault systems. Modified Mercalli Intensities (see Table 1) of up to IX are

TABLE 1
Modified Mercalli Intensity Scale

The modified Mercalli scale measures the intensity of ground shaking as determined from observations of an earthquake's effect on people, structures, and the Earth's surface. Richter magnitude is not reflected. This scale assigns to an earthquake event a Roman numeral from I to XII as follows:

I	Not felt by people, except rarely under especially favorable circumstances.
II	Felt indoors only by persons at rest, especially on upper floors. Some hanging objects may swing.
III	Felt indoors by several. Hanging objects may swing slightly. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	Felt indoors by many, outdoors by few. Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing automobiles rock. Windows, dishes, doors rattle. Wooden walls and frame may creak.
V	Felt indoors and outdoors by nearly everyone; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset; some dishes and glassware broken. Doors swing; shutters, pictures move. Pendulum clocks stop, start, change rate. Swaying of tall trees and poles sometimes noticed.
VI	Felt by all. Damage slight. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks and books fall off shelves; pictures off walls. Furniture moved or overturned. Weak plaster and masonry cracked.
VII	Difficult to stand. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary buildings; considerable in badly designed or poorly built buildings. Noticed by drivers of automobiles. Hanging objects quiver. Furniture broken. Weak chimneys broken. Damage to masonry; fall of plaster, loose bricks, stones, tiles, and unbraced parapets. Small slides and caving in along sand or gravel banks. Large bells ring.
VIII	People frightened. Damage slight in specially designed structures; considerable in ordinary substantial buildings, partial collapse; great in poorly built structures. Steering of automobiles affected. Damage or partial collapse to some masonry and stucco. Failure of some chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed pilings broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.

IX	General panic. Damage considerable in specially designed structures; great in substantial buildings, with some collapse. General damage to foundations; frame structures, if not bolted, shifted off foundations and thrown out of plumb. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground; liquefaction.
X	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Landslides on river banks and steep slopes considerable. Water splashed onto banks of canals, rivers, lakes. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	Few, if any masonry structures remain standing. Bridges destroyed. Broad fissures in ground; earth slumps and landslides widespread. Underground pipelines completely out of service. Rails bent greatly.
XII	Damage nearly total. Waves seen on ground surfaces. Large rock masses displaced. Lines of sight and level distorted. Objects thrown upward into the air.

possible on the property, based on the intensities reported by Lawson et al. (1908) for the 1906 earthquake and by Stover et al. (1990) for the 1989 Loma Prieta earthquake.

Deterministic Seismic Shaking Analysis

For the purpose of evaluating deterministic peak ground accelerations for the site, we have considered two seismic sources: the San Andreas and the Zayante (-Vergeles) faults. While other faults or fault zones in this region may be active, their potential contribution to deterministic seismic hazards at the site is overshadowed by these two faults.

Table 2 shows the moment magnitude of characteristic or maximum earthquakes, estimated recurrence interval and the distance from the site for each of these fault

systems. We took the fault data from "Database of potential sources for earthquakes larger than magnitude 6 in Northern California" (WGONCEP, 1996) and Petersen et al. (1996). Also shown on Table 2 are calculated on-site accelerations from the listed earthquakes derived using several different methods. These accelerations are based on attenuation relationships derived from the analysis of historical earthquakes. Because the historical data can be interpreted in different ways, there are a number of

TABLE 2
Faults, Earthquakes and Deterministic Seismic Shaking Data

Fault	Moment Magnitude of Characteristic or Maximum Earthquake (M_w)	Estimated Recurrence Interval (years)	Distance from Site (km)	Estimated Mean Peak Ground Acceleration (g)	Estimated Mean + One Dispersion Ground Acceleration (g)	Maximum Considered Earthquake Ground Motion[2] (g)
San Andreas (1906 rupture)	7.9	210	8.5	0.51[1]	0.74[1]	0.77[1]
Zayante (-Vergeles)	6.8	10,000	2.7	0.60[1]	0.94[1]	0.90[1]

[1] Sadigh et al., 1997
[2] FEMA, 1998

different attenuation relationships available. We have employed a fairly conservative attenuation relationship for rock/shallow soil sites in deriving the acceleration values listed in Table 2.

The "maximum considered earthquake ground motion," as defined by FEMA (1998), is also listed in Table 2. FEMA (1998) and the National Earthquake Hazards Reduction Program suggest that in regions of high seismicity, such as coastal California, the appropriate design level for ground shaking is the deterministically derived mean peak horizontal ground acceleration multiplied by 1.5. Applying this method to the study area results in ground shaking parameters roughly equivalent to the deterministically derived mean values plus one dispersion.

If the deterministically derived accelerations are used for engineering analysis on the subject property, we recommend utilizing the attenuation relationship developed by Sadigh et al. (1997). It is important to note that predicting seismic shaking intensity is a field that is dominated heavily by theory, with a paucity of near-field station readings. It should also be noted that the accelerations listed in Table 2 are only average values. Therefore, we caution that the listed values are approximations, rather than precise predictions. Actual measured "free-field" accelerations may be larger.

Based on the results listed in Table 2, the expected earthquake ground motion (mean acceleration) for the subject property may be as high as 0.60 g. The maximum earthquake ground motion (mean acceleration plus one dispersion) expected at the subject property will be approximately 0.94 g. Both values are based on a M_w 6.8 earthquake centered on

the Zayante (-Vergeles) fault, which comes to within 2.7 kilometers northeast of the subject property.

Naeim and Anderson (1993) found that "effective peak acceleration" (EPA) is more typically about 75 percent of the peak acceleration. Effective peak acceleration is comparable to "repeatable high ground acceleration" (after Ploessel and Slossen, 1974) and is generally considered to represent the large number of lower amplitude peaks on an accelerogram recording. This suggests that the mean peak horizontal ground acceleration of 0.60 g would generate an EPA of approximately 0.45 g, and the mean plus one dispersion peak ground acceleration of 0.94 g would generate an EPA of approximately 0.70 g.

The duration of strong shaking is dependent on magnitude. Dobry et al. (1978) have suggested a relationship between magnitude and duration of "significant" or strong shaking expressed by the formula:

Log D = 0.432 M - 1.83 (where D is the duration and M is the magnitude).

On the basis of the above relationship, the duration of strong shaking associated with a magnitude 6.8 earthquake (the maximum earthquake for the Zayante(-Vergeles) fault) is estimated to be about 13 seconds. In contrast, the duration of strong shaking associated with a magnitude 7.9 earthquake (the characteristic earthquake for the San Andreas fault)

is estimated to be about 38 seconds. Considering the recurrence intervals of the San Andreas and Zayante(-Vergeles) faults, the study area is much more likely to experience the characteristic event on the San Andreas, with slightly lower peak accelerations than the design earthquake on the Zayante(-Vergeles) but lasting three times as long (see Table 3). Bear in mind that the duration of strong seismic shaking may be even more critical as a design parameter than the peak acceleration itself, particularly for liquefaction analysis.

Flooding

The entire property is located within an area portrayed as being subject to "minimal flooding" on the Federal Emergency Management Agency Flood Insurance Rate Map (FEMA FIRM) (1984). In spite of this characterization, it is important to note that the large, flat-bottomed drainage swales can carry surface water after rainfall events during the winter season. Although we haven't identified flooding as a significant hazard on the property, care must be taken during the design phase of the development to ensure that the surface flow in the flat-bottomed drainages will not impact any facilities that should not be inundated and/or downstream properties.

Construction Considerations

Cut/Fill Transitions - It may possible that the infrastructure improvements for the proposed development will straddle cut/fill transitions created by the proposed grading. While such transitions are generally inadvisable for building envelopes from a geotechnical

While such transitions are generally inadvisable for building envelopes from a geotechnical engineering standpoint, because of non-uniform bearing conditions between the in-situ earth materials and artificial fill, they typically are made for roadways as differential movements are generally tolerated and typically minor if any distress occurs.

Design considerations in cut/fill transitions are differential settlement and expansion in cuts. Although expansion in the cut will occur over a short term period, most likely during the grading operations it may not be as likely for the variable fills, especially if thick fills are proposed. Even taking into consideration that ground compression within cohesionless materials is likely to take place in the short-term, their long-term compression can still be substantial and will require detailed analysis as part of a future design level study.

The significant consideration of cut/fill would be the potential for differential settlement. In some areas this can be mitigated by uniform building pad conditions. Its less practicable in roadways or for other improvements i.e. sidewalls, curbs & utilities.

Expansive Soil- Results of the Atterberg Limits tests indicate shrink/swell potential from moisture changes is low and not a significant factor in regard to foundation design with in-situ soils as generally encountered. However, where high-fines content soils are exposed (such as in the area of Boring No, 11), re-evaluation would be warranted to ascertain the soil conditions and to provide design and construction options. Since in some areas they

can be potentially influenced by the landscape watering demand, soils with high-fines content and which are shown to be influenced by moisture variation will require further study and remediation. The significant option would be to remove the potentially problematic soils to a depth that they would not materially influence improvements. It's assumed the removed soils will be replaced with engineered fill of low-expansive characteristics.

Groundwater - Whether natural or that which may develop as a result of grading, drainage patterns and irrigation is often considered a major factor in structural distress due to consolidation and slope instability, and a general nuisance where local seeps occur. To control water, subdrain systems and controlled irrigation are generally recommended.

Surficial Stability

In our opinion, the potential for shallow landsliding to occur on the existing native slopes is low for the lifetime of the proposed development. However, it is important to note that relative slope stability issues may arise in the future, depending upon the further decisions being made about the proposed grading scheme for the subdivision, as well as for grading that occurs on individual lots. Proper design and placement of septic system leach fields may also impact the stability of both native and man-made slopes, particularly with respect to the geological subsurface conditions discussed earlier in the report. Finally, choices made for landscape and landscape irrigation might have unforeseen impacts if the natural

conditions are not taken into account. For example, if automatic timing devices are used in conjunction with irrigation systems, provisions should be made to interrupt normal watering during the rainy season. The retained Landscape Architect for this project is the best party to consult regarding the watering methods etc. as they will be subject to the type of plants, lawn and planting configuration.

It is important for these issues to be revisited and carefully studied in regard to the forthcoming detailed grading, erosion control, septic and landscaping plans.

Detention Ponds & Water Features

The site plan indicates there is one detention pond planned for this development of slightly more than 1 acre feet (±) in area. The plan also shows an existing detention pond on Lot No. 4. This pond is located immediately downstream of roadways. Considering the lateral transmissivity of the soils that will form the bottom of the pond, it is possible that construction of the pond will raise seasonal groundwater levels in the surrounding area. Construction of the pond may also raise seasonal groundwater levels within the drainage swale downstream from the subject property, which may impact downstream developments.

Sewage Treatment

The site plan indicates that sewage disposal shall be by septic systems, presumably individual systems for each proposed lot. We have not been provided with percolation test results or detailed septic system plans to review, so we cannot comment on the feasibility of design specifics in regard to wastewater disposal.

We do recommend, however, that all future project sanitarians and wastewater engineers take into account the high lateral transmissivity of the sands, as well as the potential for buried clay pans or hard pans that are essentially impermeable. The combination of the aforementioned conditions can potentially contribute to septic system failure or the daylighting of effluent, particularly near cut slopes.

If individual septic systems are adequately designed (keeping in mind the aforementioned parameters), constructed and maintained, they should not, in our opinion, cause slope instability in and of themselves.

General Grading Considerations

In the following subsections, we present general grading considerations that should be incorporated as part of the mass grading plan and specifications. Other more standard details to be incorporated in the design plans should be presented in the future pre-design and/or design level geotechnical reports for this project.

Rough Grading

In consideration of any proposed grading, it is envisioned that rough grading operations will involve the excavation/cutting of earth materials from the higher elevation areas and filling the lower elevation areas under controlled conditions, i.e. in conformance with the grading plans. We envision that during this process other activities would be performed, such as:

a) Cut/fill Transition - In this case the concern arises where the cut/fill transition is located within the building pad and/or within the influence of the building pad. Further evaluation and discussion with the designers is necessary to deal with cut/fill transitions as each lot is developed.

b) Slope Stabilization - Slope stabilization measures may have to be pursued, depending upon the proposed grading, erosion control, septic system and landscaping schemes. It is important for these issues to be revisited and carefully studied in regard to the forthcoming detailed grading, erosion control, septic and landscaping plans.

c) Fill Slopes - In creating fill slopes it is often difficult to compact the surficial soils (outer edge) of the embankments. Therefore, we recommend that the fill slopes be overbuilt and cut back to the compacted mass. A less desirable alternative would be to compact the surface by track walking the slope with a bulldozer. Track-walking or

other compaction methods are less effective where the loose soils are thick along the outer edge.

d) Slope Rounding - In consideration of the types of earth materials, predominately sands with fines, slope rounding should be incorporated in the grading plan. As mentioned elsewhere in this report, these soils are prone to accelerated erosion and will not stand at steep gradients without rapidly developing rills and gullies. Slope rounding in cut banks should also be incorporated into the grading plan.

e) Cut/Fill Slopes - The Tentative Map does not indicate slope gradients for cut/fill slopes. While slope gradients of 2:1 (horizontal to vertical) are a reasonably stable configuration, there are areas that require site specific quantitative slope stability analysis (i.e. in areas identified as water features).

POTENTIAL GEOLOGIC AND GEOTECHNICAL IMPACTS

Grading Considerations

We expect the near-surface soils within the subdivision to consist of unconsolidated to moderately consolidated sands with silt and clay in the flat-bottom drainages and slightly to well cemented sands on the slopes. Under optimum moisture conditions, most of these soils will be suitable to be used as engineered fill. The geotechnical engineer and geologist should consult with the design team that prepares the final grading plans and

specifications for mass grading, allowing for geotechnical/geologic input as the specifications are being developed.

Subdrains within Drainages - Subdrains within the drainage channels are necessary to maintain subdrain flow of potential seeps and natural migration of subsurface water into these natural drainages.

Fill Embankment Toe Keys and Benching - Toe-key construction for structural fill should be employed, especially where toes terminate on hillsides with gradients of 10:1 (horizontal to vertical) or steeper. The toe key should be excavated from the ground surface into firm in-situ soils and should be 1.5 times the bulldozer blade width, but not less than 12 feet. Typically, the downhill side of the key is excavated down at least 2 feet into firm soils, therefore, the total cut depth should be anticipated to be greater than 2 feet. Benching depths and widths normally vary and are adjusted under field conditions. During construction, if seeps are identified, subdrains are normally provided.

Building Code Seismic Information

Based upon the subsurface soil conditions encountered and local seismic sources, the site maybe characterized for design based on chapter 16 of the 1997 UBC using the following information. In determining these values, it was assumed that the nearest active fault is the Zayante Fault, which is assumed to be located at approximate distance of 3.0 km from

the site. A slip ratio of 0.1 mm/yr was assumed. The following parameters are considered minimums for design of the residence, and they were developed assuming that the building foundation elements are influenced by the silty/clayey sands.

Soil Type=S_d
Seismic Zone Factor=Z=0.40

FAULT NAME	DISTANCE TO SITE	SLIP RATE (mm/yr)	UBC FAULT TYPE	Na	Nv	Ca	Cv
San Andreas	8.5 km	24.0	A	1.0	1.2	0.44	0.77
Zayante-Vergeles	2.7 km	0.10	B	1.2	1.5	0.53	0.96

CONCLUSIONS

Based on the information gathered and analyzed, it is our opinion that the proposed development is, for the most part, geologically and geotechnically feasible, provided our recommendations are followed. The residential development on the subject property will be, in our opinion, subject to "ordinary risks" as defined in Appendix B, provided our recommendations are followed. Appendix B should be reviewed in detail by the developer and all property owners to determine whether an "ordinary" risk as defined in the appendix is acceptable. If this level of risk is unacceptable to the developer and the property owners, then the geologic and geotechnical hazards in question should be mitigated to reduce the corresponding risks to an acceptable level. The acceptable level would need to be defined

by the developer/owner in conjunction with a consultant having geotechnical-related expertise.

The study area is located in an area of high seismic activity and will be subject to strong seismic shaking in the future. Modified Mercalli Intensities of IX are possible. The controlling seismogenic sources for the subject property are the San Andreas and Zayante (-Vergeles) faults, 8.5 and 2.7 kilometers respectively to the northeast. Deterministic mean and mean plus one dispersion horizontal peak ground acceleration values for this earthquake may be as high as about 0.60 g and 0.94 g, respectively for the subject property. The maximum considered earthquake ground motion as defined by FEMA (1998) may be as high as 0.90 g for the proposed development, when considering the design earthquake on the Zayante(-Vergeles) fault. Expected duration for the design earthquake on the Zayante(-Vergeles) fault is about 13 seconds. In contrast, the duration of strong shaking associated with a M_w 7.9 earthquake (the characteristic earthquake for the San Andreas fault) is estimated to be about 38 seconds. Considering the recurrence intervals of the San Andreas and Zayante(-Vergeles) faults, the study area is much more likely to experience the characteristic event on the San Andreas fault, with slightly lower peak accelerations than the design earthquake on the Zayante(-Vergeles) fault but lasting three times as long (see Table 2). Bear in mind that the duration of strong seismic shaking may be even more critical as a design parameter than the peak acceleration itself, particularly for liquefaction analysis.

The bulk of the sandy earth materials underlying the property appear to be of high enough relative density to characterize them as having a low liquefaction susceptibility. The drainage swales, however, appear to be underlain by loose sandy materials with perched groundwater, specifically in the vicinity of boring B-1 (see Plate 1), leading us to conclude that those materials may have a moderate liquefaction susceptibility. In our opinion the potential for liquefaction to occur within the lifetime of the development is moderate for the areas underlain by colluvium (within the drainage swales), and low for the balance of the property, based upon the site conditions. We hasten to add that this assessment was made in the absence of a detailed quantitative liquefaction analysis, which was beyond the scope of work performed for this project.

In our opinion, the potential for landsliding to occur on the native slopes is low for the lifetime of the proposed development. However, it is important to note that relative slope stability issues may arise in the future, depending upon the further decisions being made about the proposed grading scheme for the subdivision, as well as for grading that occurs on individual lots. It is important for this issue to be revisited and carefully studied in regard to the forthcoming detailed grading plans.

Severe erosion is common in the sandy soils present upon the rolling hills terrain in this region, particularly where the natural drainage is modified by the works of man and not properly controlled. Development of rills and gullies due to inadequate drainage design,

construction or maintenance may significantly impact the proposed development. The Civil Engineers that develop the grading plans will need to address this issue by providing erosion control measures, such as, energy dissipaters, lined ditches, catch basins, etc. that will reduce the potential of accelerated erosion. Provisions for maintenance will be a requirement in development of this property during and past construction.

Although we haven't identified flooding as a significant hazard on the property, care must be taken during the design phase of the development to ensure that the surface flow in the flat-bottomed drainages will not impact facilities that should not be inundated, including facilities and residences on adjacent properties downstream from the subject property.

RECOMMENDATIONS

General Recommendations

1. We recommend that site-specific, quantitative-level analyses be performed for the potential settlement that may occur within the major fills being tentatively proposed at this stage of the project.

2. We recommend assisting the design team in locating the proposed buildings in areas of cut/fill transitions where fills of 5 feet or greater in thickness are required. Uniform graded pads for buildings on lots with cut/fill transitions is recommended. The minimum depth of overexcavation should be subjected to review by the geotechnical engineer.

3. We present a number of different accelerations in the table below. If the deterministic results are used by the project engineers, the data generated from our "design" earthquake, a M_w 6.8 centered on the Zayante, as near as 2.7 kilometers to the proposed development, should be utilized. We recommend that the results calculated using the Sadigh et al. (1997) attenuation relationship be utilized. The project engineers should use the data generated by the method that is most appropriate for the intended design.

TABLE 2
Faults, Earthquakes and Deterministic Seismic Shaking Data

Fault	Moment Magnitude of Characteristic or Maximum Earthquake (M_w)	Estimated Recurrence Interval (years)	Distance from Site (km)	Estimated Mean Peak Ground Acceleration (g)	Estimated Mean + One Dispersion Ground Acceleration (g)	Maximum Considered Earthquake Ground Motion[2] (g)
San Andreas (1906 rupture)	7.9	210	8.5	0.51[1]	0.74[1]	0.77[1]
Zayante (-Vergeles)	6.8	10,000	2.7	0.60[1]	0.94[1]	0.90[1]

[1] Sadigh et al., 1997
[2] FEMA, 1998

4. We recommend that drainage from improved surfaces such as walkways, patios, roofs and driveways be collected in impermeable gutters or pipes and carried to a drainage system or natural drainage course. However, no water generated or collected for the development should be discharged or allowed to flow into any existing gullies or rills. At no time should any concentrated discharge be allowed to spill directly onto the ground adjacent to the proposed developments. Any water landing on paved areas should not be allowed to flow toward the proposed developments. At no time should concentrated runoff be allowed to spill onto steep slopes or to pond above steep slopes. Where development may interrupt natural drainage channels, a drainage scheme should be instituted to redirect runoff into

natural drainages. The control of runoff is essential for erosion control and prevention of ponding water against embankments, cut banks, structure foundation, etc.

Control of runoff water is the single most important thing developers and homeowners can do to reduce the potential for erosion. Avoiding the concentrated disposal of surface water runoff into existing drainages may significantly slow the development of the gullies and rills.

Where the proposed development may be significantly impacted by erosion due to the development of gullies or ravines, formal erosion control measures should be employed.

5. If it is ascertained that any facilities for this project which will be impacted by the flow of water through the large, flat-bottomed drainages, then those facilities should either be relocated, or designed to withstand the anticipated flows.

6. Differential settlement due to the varying soil and geologic conditions should be anticipated. Rigid structures that cannot tolerate excessive differential settlements should be designed for these conditions.

7. Development that could be damaged or destroyed by liquefaction and its attendant effects of differential settlement and lateral spreading should be relocated away from this hazard. If the prospective liquefaction hazard to any proposed developments cannot be mitigated by avoidance, we recommend that a detailed quantitative liquefaction analysis be performed by the project geotechnical engineer, and mitigation recommendations such as ground improvement or foundation improvements be issued.

8. We recommend that project geotechnical engineer re-evaluate the soil conditions with respect to the impacts of soil expansivity where high-fines content soils are exposed (such as in the area of Boring No, 11), and revised design and construction options be issued where warranted.

9. On the basis of the preliminary findings, structures conceivably can be supported upon conventional spread footing systems. However, due to the topographic relief and grading requirements there will be areas where other types of foundation design will be more appropriately suited, i.e. cast-in-place pier and grade beam foundation system, mat-type foundations and other suited foundation systems. This needs to be evaluated further when design concepts are being developed for the individual parcels.

10. We recommend that the project sanitarian, landscape architect and civil engineer carefully review our report, particularly in regard to slope stability issues that may arise from grading, erosion control, irrigation and landscaping designs that don't adequately take the existing geologic conditions into account. We also recommend that the project geotechnical engineer and geologist be retained to review any plans issued by the aforementioned design professionals in the future to ensure that the conclusions and recommendations of this report have been properly implemented.

11. Our firm should be accorded the privilege of reviewing any additional geotechnical or geologic reports for this project and any new civil engineering plans, so that our recommendations may be properly interpreted and implemented. We do not intend to approve or disapprove the plans, but to provide an opportunity to update the preliminary report and include additions or qualifications as necessary. If our firm is not accorded the opportunity of making the recommended review, we can assume no responsibility for misinterpretation of our recommendations.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The conclusions and recommendations noted in this report are based on probability and in no way imply that the proposed development will not possibly be subjected to ground failure or seismic shaking so intense they will be severely damaged or destroyed.

2. This report is issued with the understanding that it is the duty and responsibility of the owner or his representative or agent to ensure that the recommendations contained in this report are brought to the attention of the architects and engineers and contractors for the project, incorporated into the plans and specifications, and that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

3. The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice. No other warranty, expressed or implied, is made.

4. If any unexpected variations in soil conditions, or if any undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the present time, Haro, Kasunich and Associates, and Nolan, Zinn and Associates should be notified so that supplemental recommendations can be given.

5. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report

may be invalidated, wholly or partially, by changes outside our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by a geotechnical engineer and an engineering geologist.

REFERENCES

Aerial Photographs

DATE FLOWN	FLIGHT LINE	PHOTO NUMBERS	PRINTS
08/17/49	ABG-16F ABG-14F	192-195 167-169	Black & white
06/14/68	GS-VBZK 3	61 & 62	Black & white
09/21/97	WAC-91CA 16	17 & 18	Black & white
08/21/98	NAPP 10525	87 & 88	Black & white
10/24/00	WAC-00-CA 27	155-157	Black & white

All of the above listed aerial photographs are available for viewing at the Science Library, at the University of California at Santa Cruz.

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Appendix J

Noise Analysis

LATOURETTE SUBDIVISION
ENVIRONMENTAL NOISE ASSESSMENT
MONTEREY COUNTY, CALIFORNIA

August 24, 2005

♦ ♦ ♦

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INTRODUCTION

This report presents the results of the environmental noise assessment conducted for the proposed LaTourette Subdivision in Monterey County, California. This assessment presents the fundamentals of environmental noise, provides a discussion of policies and standards applicable to the project, presents the results of noise measurements conducted at the project site, and provides an evaluation of the potential significance of impacts resulting from the project. The major issues evaluated in the noise assessment include the compatibility of residential development with the noise environment at the project site and the potential for long-term or short-term noise impacts resulting from project-generated construction noise or increased vehicular traffic along local roadways.

SETTING

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its loudness. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. *A decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level or dBA.* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level, CNEL*, is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level,* L_{dn}, is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

TABLE 1 Definitions of Acoustical Terms Used in this Report

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, Leq	The average A-weighted noise level during the measurement period. The hourly Leq used for this report is denoted as dBA $L_{eq[h]}$.
Lmax RMS Level	The maximum root-mean-square (RMS) sound pressure level during a measurement – measured using the "fast" exponential time constant.
L_{01}, L_{05}, L_{10}, L_{90}	The A-weighted noise levels that are exceeded 1%, 5%, 10%, and 90% of the time during the measurement period.
Day-Night Average Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	120 dBA	
Jet fly-over at 300 meters		Rock concert
	110 dBA	
Pile driver at 20 meters	100 dBA	
		Night club with live music
	90 dBA	
Large truck pass by at 15 meters		
	80 dBA	Noisy restaurant
		Garbage disposal at 1 meter
Gas lawn mower at 30 meters	70 dBA	Vacuum cleaner at 3 meters
Commercial/Urban area daytime		Normal speech at 1 meter
Suburban expressway at 90 meters	60 dBA	
Suburban daytime		Active office environment
	50 dBA	
Urban area nighttime		Quiet office environment
	40 dBA	
Suburban nighttime		
Quiet rural areas	30 dBA	Library
		Quiet bedroom at night
Wilderness area	20 dBA	
	10 dBA	Quiet recording studio
	0 dBA	Threshold of human hearing

Regulatory Background

The State of California and Monterey County establish guidelines and policies designed to limit noise exposure at noise sensitive land uses. Appendix G of the State CEQA Guidelines and the Monterey County's Health and Safety Element of the Draft General Plan present the following:

(1) State CEQA Guidelines. The California Environmental Quality Act (CEQA) contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. CEQA asks whether the proposed project would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies?

- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

(2) Monterey County Health and Safety Element of the 1982 General Plan. The current General Plan presents the following policies and objectives that would be applicable in the project's noise assessment. The goal of the County is, "...to maintain an overall healthy and quiet environment by trying to achieve living and working conditions free from annoying and harmful sounds."

***Objective* 22.2** Ensure, through land use planning, a quiet acoustic environment in portions of the County to be developed.

Policies

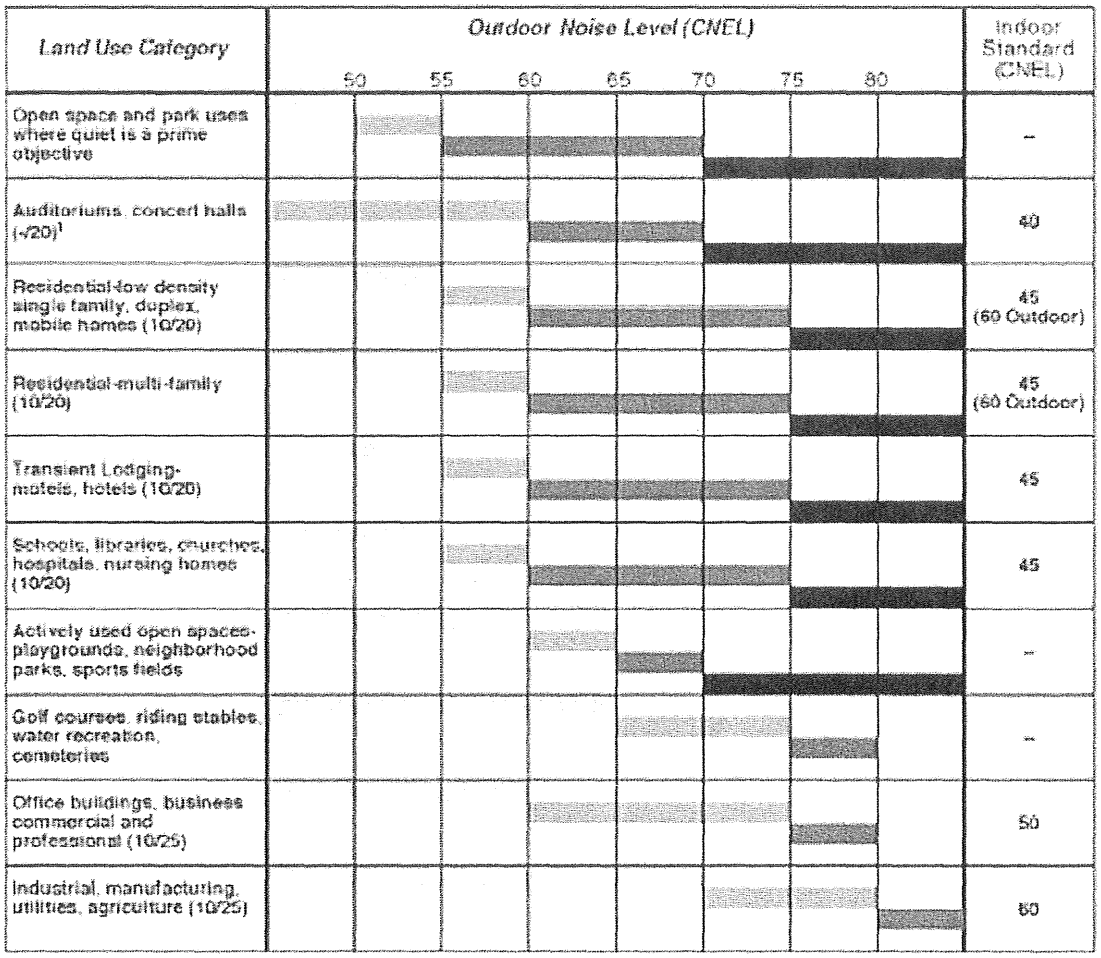
22.2.1 The County shall require new development to conform to the noise parameters established by Table 3, Land Use Compatibility for Exterior Community Noise Environments.

22.2.2 The County shall require the appropriate standards of soundproofing construction in all multiple-residential structures as specified in the Building Code.

22.2.3 The County shall require environmental review of all proposed new development, expansion of industrial facilities, and quarry excavation and processing activities which may increase the noise level in surrounding areas or generate noise levels greater than those specified in Table 3.

According to the "Land Use Compatibility for Community Noise" chart, low-density residential developments are considered "normally acceptable" in exterior noise environments of 55 CNEL or less. Interior noise levels should be limited to 45 CNEL or less.

TABLE 3 Land Use Compatibility for Community Noise Guidelines



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

Conditionally Acceptable: Conventional construction will achieve indoor noise standards, but closed windows and fresh air supply systems or air conditioning will be required

Normally Unacceptable: New construction or 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. Closed windows and fresh air supply systems or air conditioning will be required. Other building upgrades will probably be needed and should be specified in the acoustical report to meet indoor noise standard. Additionally, residential uses must show that they will achieve an outdoor noise standard of 60 CNEL or less

Clearly Unacceptable: New construction or replacement of an existing structure or use shall be disallowed

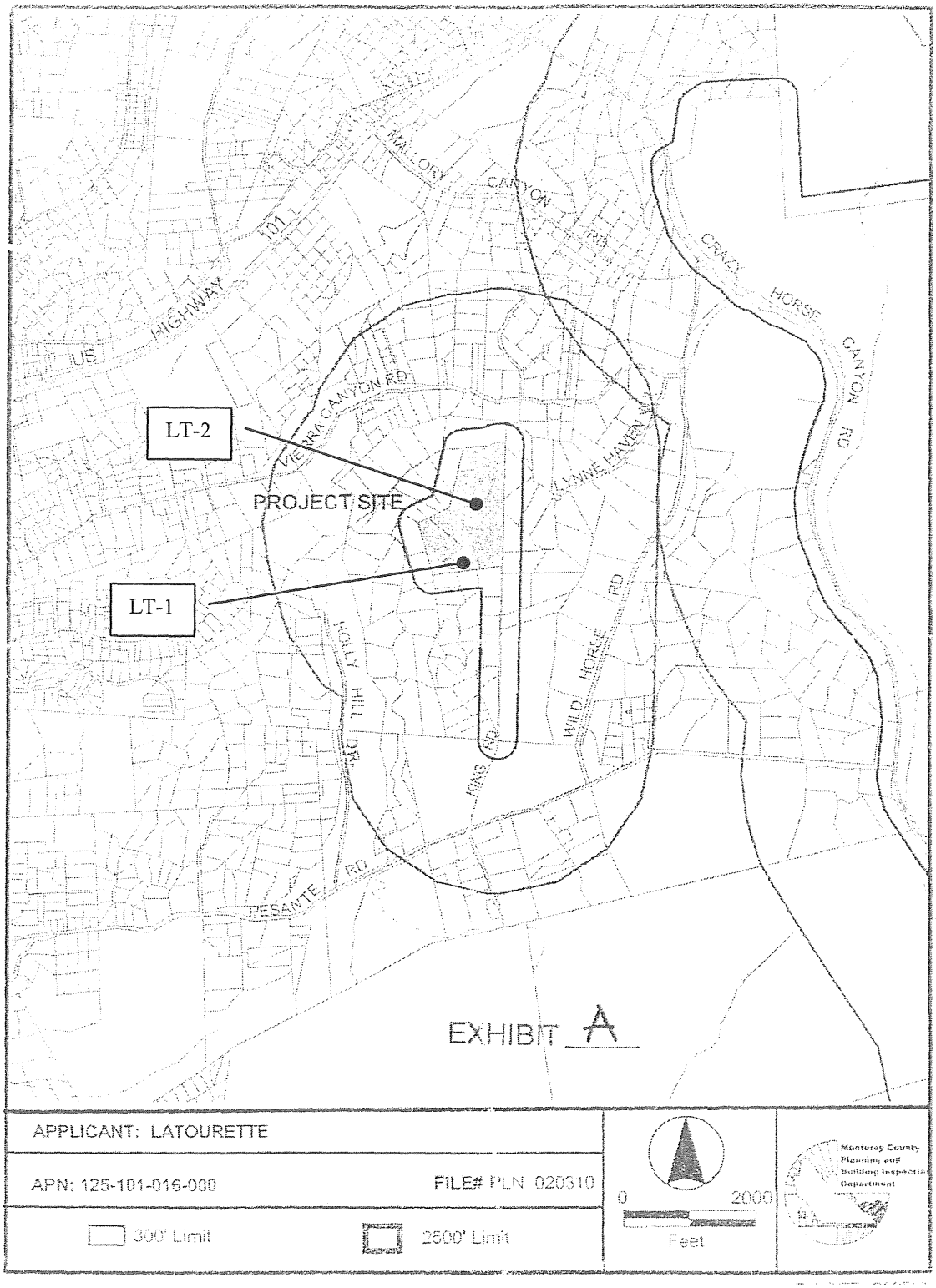
Existing Noise Environment

The LaTourette Subdivision is located in Monterey County northeast of Prunedale. More specifically, the site is located between Vierra Canyon Road in the north and Pesante Road in the south at the northernmost terminus of Woodland Heights Lane. Rural residential and semi-rural residential land uses surround the project site. The nearest noise-sensitive residential land uses (Woodland Heights Estates) are located just south of the project site. The project site vicinity is shown in Figure 1.

A noise monitoring survey was conducted from July 24, 2004 to July 27, 2004 to quantify the existing noise environment at the project site and nearest existing residential uses. Two long-term noise measurements were conducted to document the existing noise level trend over a 24-hour period. The first long-term noise measurement was conducted near the south end of the project site adjacent to Woodland Heights Estates. This monitoring location was selected to represent the noise environment at the nearest existing residential land uses to the project site. The CNEL calculated from the data collected during the course of the measurement period was 39 dBA. The data collected at Site LT-1 are summarized in Figure 2.

A second long-term noise measurement location was selected in the central portion of the site (near proposed Lot 11) to document the noise level variation throughout the site. The CNEL calculated from the hourly noise data was 40 dBA. The data collected at Site LT-1 are summarized in Figure 3. Based on the results of the noise monitoring, environmental noise levels are low resulting primarily from distant vehicular traffic, wind, birds, and insects.

Figure 1 – Project Site and Vicinity



Noise Levels at LT-1
Southernmost Property Line of Project Site
July 26th, 2004

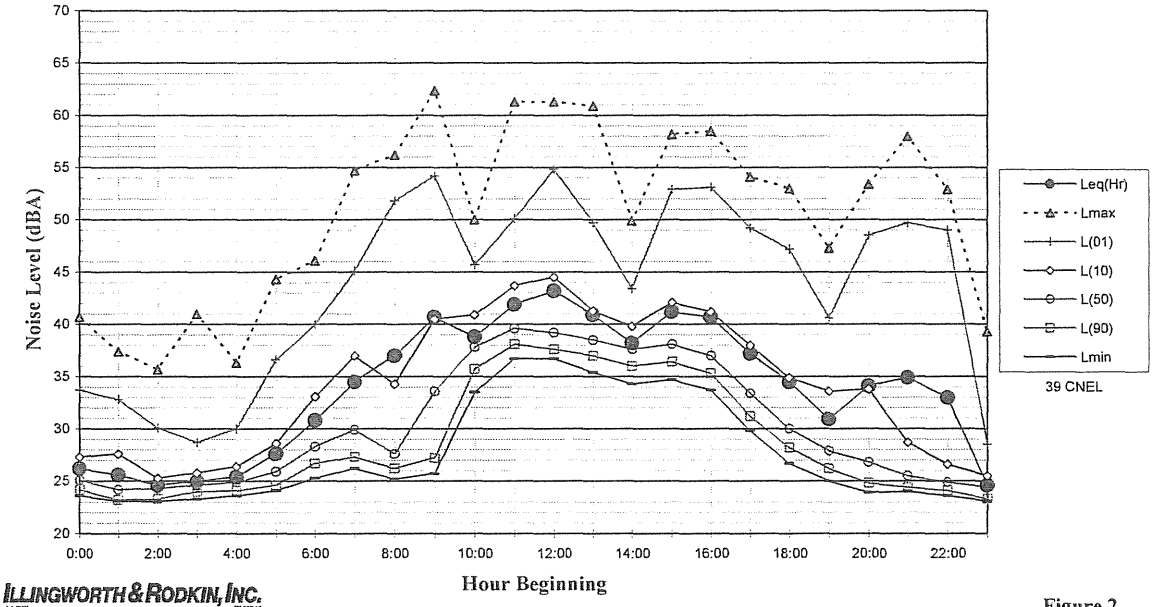


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Figure 2

Noise Levels at LT-2
Lot 11 - Center of Project Site
July 26th, 2004

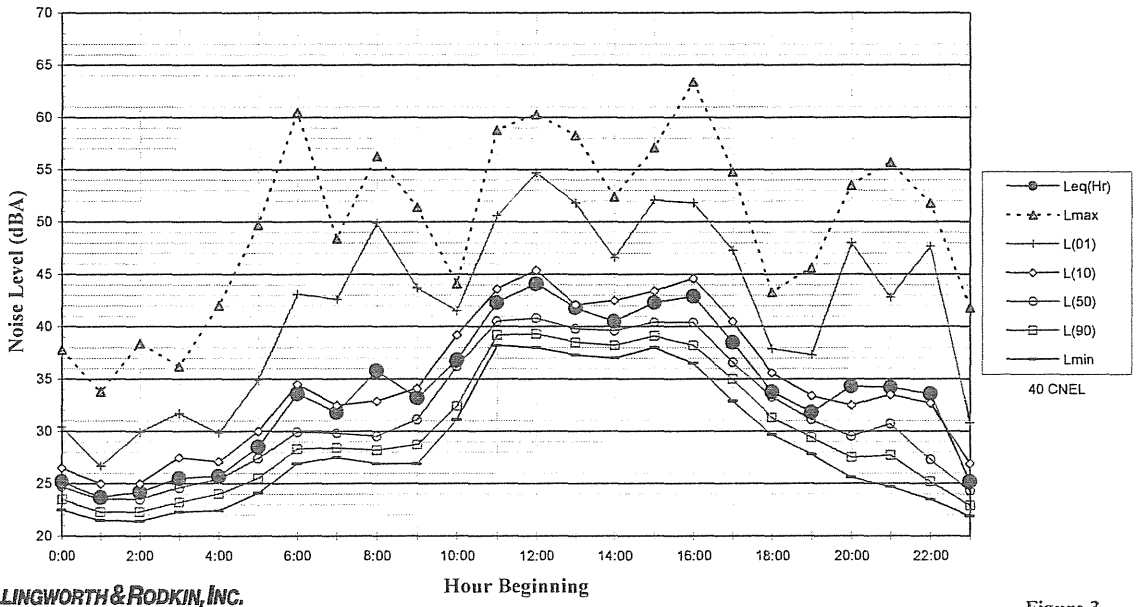

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Figure 3

NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria

A significant noise impact would be identified for a proposed land use if it would be exposed to noise levels exceeding the County's established guidelines for noise and land use compatibility. For the proposed project, a significant impact would be identified if noise-sensitive receivers proposed by the project would be exposed to noise levels exceeding the County's established guidelines for "normally acceptable" noise and land use compatibility (55 CNEL in exterior areas or 45 CNEL in interior spaces). Significant noise impacts would also result if project-generated noise would expose existing noise sensitive receivers in the project vicinity to levels that are permanently or temporarily increased over existing conditions. A substantial permanent noise increase would occur if the project resulted in a noise level increase of 5 dBA CNEL or more where noise levels are currently below 55 CNEL or 3 dBA CNEL or more where existing noise levels exceed 55 CNEL. Temporary noise impacts generated by project construction would be treated somewhat differently. Significant noise impacts would result from construction if noise levels are sufficiently high to interfere with speech, sleep, or normal residential activities. Construction-related hourly average noise levels received at noise-sensitive land uses exceeding 60 dBA $L_{eq(hr)}$, and at least 5 dBA above the ambient, would be considered significant if the noise-generating construction phase lasted more than 12 months.

Impact 1 **Noise and Land Use Compatibility**
The existing and future noise environment at the project site would be compatible with residential development. This is a **less than significant** impact.

The project site is located in a semi-rural area away from noise sources such as vehicular traffic on arterial roadways or highways. Noise levels at the project site are well below the County's acceptable exterior noise level limit of 55 CNEL for new residential housing. Future noise levels at the project site are not expected to substantially increase over existing conditions. Interior noise levels within proposed residential units would also be less than 45 CNEL assuming standard California construction practices. This is a less than significant impact.

Impact 2 **Off-Site Project-Generated Traffic Noise.**
The operation of the proposed project will generate a slight increase in traffic volumes along the local roadway network serving the project site. This increase in traffic will not substantially increase noise levels at noise sensitive receptors in the project vicinity. This is a **less than significant** impact.

Based upon a review of the traffic study prepared by *Hexagon Transportation Consultants, Inc.*, traffic noise generated by the project would not measurably increase existing noise levels at residential receptors in the vicinity of the project site. Existing AM and PM peak-hour traffic volumes were compared to AM and PM peak-hour traffic volumes with the project along roadway links in the project vicinity. The calculated increase in peak-hour average and daily noise levels as

a result of project-generated traffic would be less than 1 decibel. This increase would not be perceptible or measurable.

Up to 16 peak hour trips would occur as a result of the project along the site's access roadway. Access to and from the site would be from either King Road or the Woodland Heights Subdivision. Preliminary traffic noise modeling was conducted to calculate the hourly average noise level generated by these vehicle trips. The results of the traffic noise modeling indicate that hourly average noise levels generated by project traffic would be 44 dBA L_{eq}. This noise level would be approximately equal to existing peak-hour noise levels measured near the Woodland Heights Subdivision. Maximum noise levels generated by an auto passby at a distance of 25 feet are approximately 50 to 60 dBA. These noise levels would also be similar in level to existing maximum noise levels at the nearest receivers.

A worst-case assessment would assume that the project's traffic would increase the overall hourly L_{eq} by 3 dBA to 47 dBA L_{eq}. Similarly, the CNEL would increase by 3 dBA to 42 to 43 dBA. This noise level increase would be barely perceptible and the impact would be considered less than significant as noise levels would still be well below the County's acceptable threshold for acceptable residential uses and would not exceed the 5 dBA CNEL significance threshold. Project-generated traffic would result in a less than significant noise impact at nearby receivers.

Mitigation Measures NONE

Impact 3 **Project Construction.**
Noise generating activities associated with the construction of the proposed project would temporarily elevate noise in the vicinity of the project site. Adjacent residential land uses would be exposed to high construction noise levels for a period of three to nine months. With the implementation of standard construction noise control measures and reasonable hours of construction, the impact would be **less than significant.** with mitigations

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The construction of the project would generate noise, and would temporarily increase noise levels in the immediate vicinity of the project site. Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Construction activities generate considerable amounts of noise, especially during the demolition phase and the construction of project infrastructure when heavy equipment is used.

Construction of the proposed project (infrastructure improvements) would generally involve the following types of construction equipment: tractors, backhoes, compactors, rollers, dump trucks, and the like. Most of the equipment would be brought to the site at the beginning of work and left there until the completion of construction. As necessary, trucks would bring materials such as water pipes, gravel and asphalt for the road, etc. to the site. These deliveries would likely take place over a short period of time (e.g., less than a month). The estimated number of construction

workers on-site at any one time to complete the infrastructure improvements is approximately 20. The start of construction of the proposed project depends on the project approval date, seasonal factors, market conditions, and the contractor's schedule; the estimated construction duration is between three and nine months. The project includes grading (approximately 5,400 cubic yards) for construction of an access road. From King Road, there are two possible alternatives to access the site: through the extension of the existing main road in the Woodland Heights subdivision to the site, or through the construction of a new access road off King Road in the southeast corner of the site.

The highest maximum noise levels generated by project construction would typically range from about 90 to 98 dBA at a distance of 50 feet from the noise source. Typical hourly average construction generated noise levels are about 81 dBA to 89 dBA measured at a distance of 50 feet from the center of the site during busy construction periods. Construction generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the source and receptor. Shielding provided by buildings or terrain result in much lower construction noise.

Construction activities would yield noise levels greater than 60 dBA L_{eq} and at least 5 dBA L_{eq} above ambient noise conditions. With the incorporation of the following standard construction noise control measures, and recognizing that the disturbance will be temporary, the impact would be considered less than significant.

- Noise-generating activities at the construction site or in areas adjacent to the construction site associated with the project in any way should be restricted to the hours of 8:00 a.m. to 5:00 p.m., Monday through Friday. No construction activities should occur on weekends or holidays.

- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Locate stationary noise generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.

- Utilize "quiet" air compressors and other stationery noise sources where technology exists.

- Radios shall be controlled as to not be audible outside of the project site.

- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with the adjacent noise sensitive facilities so that construction activities can be scheduled to minimize noise disturbance.

- Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.

Additional Mitigation Measures **NONE**

Appendix K

Water Balance Analysis

QUESTA
ENGINEERING CORP.

Water Balance and Nitrate Loading Analysis

for

La Tourette Subdivision Prunedale, California

Prepared for

Denise Duffy and Associates, Inc.
947 Cass St., Suite 5
Monterey, CA 93940

April 15, 2022

Civil,
Environmental
& Water
Resources

WATER BALANCE AND NITRATE LOADING ANALYSIS

FOR

LA TOURETTE SUBDIVISION
PRUNEDALE, CALIFORNIA

Prepared for

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April 15, 2022



Norman N. Hantzsche, P.E.

TABLE OF CONTENTS

INTRODUCTION AND BACKGROUND 2

INTRODUCTION 2
PROPOSED PROJECT AND SETTING 2

WATER BALANCE ANALYSIS 3

INTRODUCTION 3
RAINFALL-RECHARGE FROM OPEN SPACE/LANDSCAPED AREA 3
WASTEWATER PERCOLATION 6
STORMWATER RETENTION-PERCOLATION 6
GROUNDWATER EXTRACTION (PUMPING) 8
WATER BALANCE SUMMARY 8

NITRATE LOADING ANALYSIS 11

METHODOLOGY 11
DATA AND ASSUMPTIONS 11
RESULTS 13
DISCUSSION 13

REFERENCES 15

FIGURES

Figure 1 - Project Site Hydrology

ATTACHMENTS

Attachment A - Stormwater Retention Calculations
Attachment B - Nitrate Loading Calculations

Introduction

This report presents a water balance and nitrate loading analysis for the proposed La Tourette Subdivision located near Prunedale in Northern Monterey County. This work was conducted as provide supporting technical information and analysis for the environmental impact analysis of the proposed project. The work was completed by Questa Engineering Corporation on behalf of the County of Monterey, under a sub-contracting agreement with Denise Duffy & Associates, Inc. Questa Engineering also provided consulting assistance for sections of the Draft Environmental Impact Report addressing Wastewater Disposal (4.14) and Water Supply (4.15), which utilize information and findings from this technical report.

The topics covered in this report include the following:

- **Water Balance Analysis**
- **Nitrate Loading Analysis**

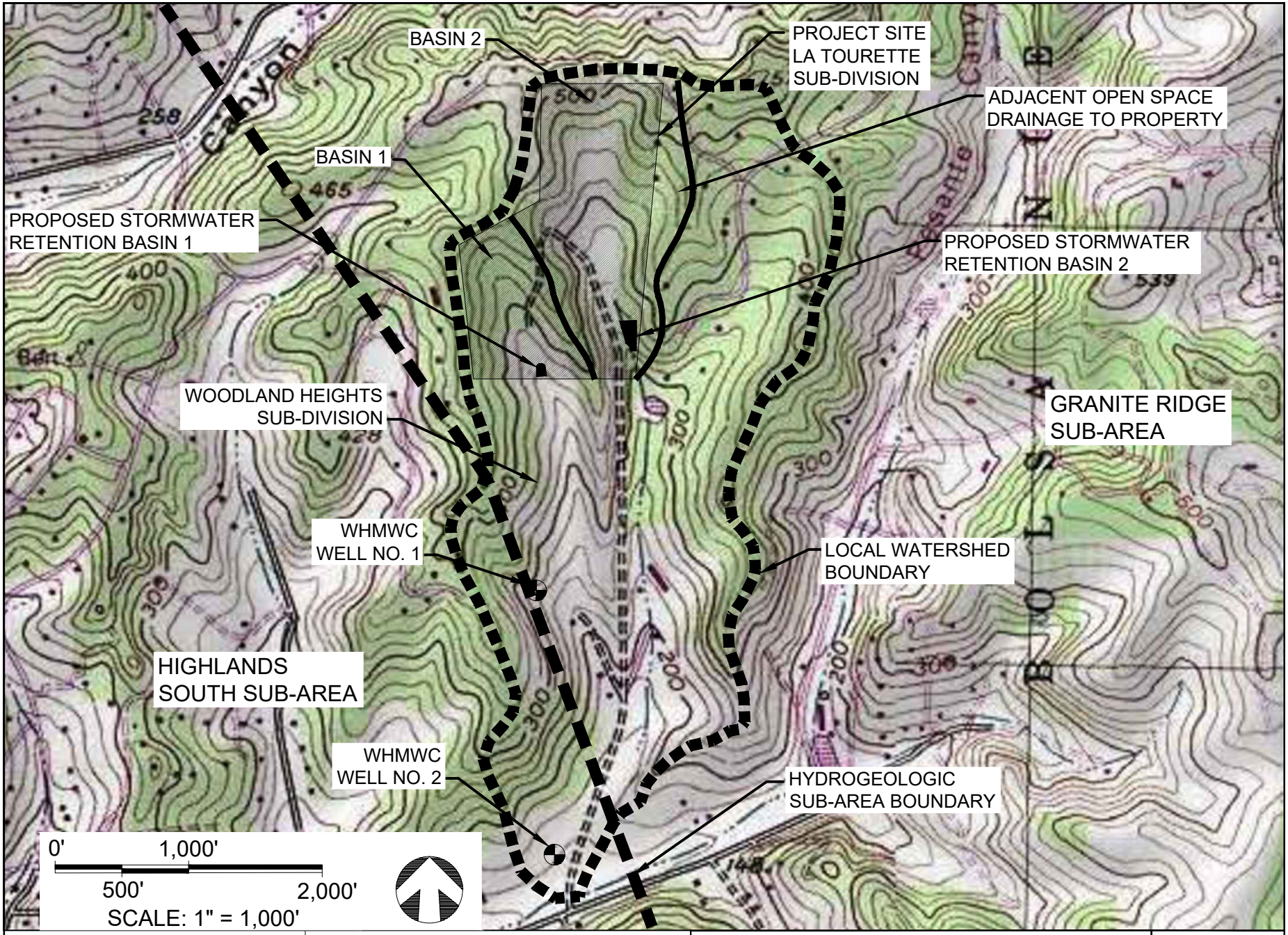
Proposed Project and Setting

The proposed La Tourette Subdivision is located in a rural area of Monterey County known as the Prunedale Hills. It is located north of the Pesante Road/King Road intersection, approximately two miles east of Highway 101. The project area is composed mainly of rolling hills supporting some grazing and rural residential development. This property, which is currently developed with three single-family residences and supporting structures and infrastructure, is surrounded by sparsely developed lands to the west, north and east, and a partially developed subdivision (Woodland Heights) to the south (**Figure 1**).

The project proposes the division of an approximately 47.8-acre project parcel (APN 125-101-016) into 19 lots ranging in size from 1.2 to 5.3 acres. The project proposes expansion of the existing Woodland Heights Mutual Water Company to provide water to the subdivision. Individual onsite septic systems at each parcel will be utilized for sewage disposal.

The project site is situated on the south-facing slopes of Pesante Creek Canyon. Elevations on the site range from 390 feet above mean sea level (amsl) along the southern edge of the property to 560 feet amsl on the north end of the property. The topography is predominantly rolling hills, with slopes ranging from about 8 to 25 percent. Most of the site is grassland with stands of pine, oak and madrone trees and brush making up the balance of the site. There are no defined streams or watercourses on the property; the site drains to the south through two prominent broad swales.

Presently, the project site is largely undeveloped, with three residential structures. The existing residences obtain their water supply from a well located in the southeast corner of the site and utilize onsite septic systems for wastewater disposal. Under the proposed project these residences will be removed; and the septic systems will be replaced with new facilities installed under current County permit requirements. The existing water well will remain for non-potable uses only.



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PROJECT SITE HYDROLOGY

LA TOURETTE SUB-DIVISION

FIGURE

1

WATER BALANCE ANALYSIS

Introduction

The proposed project will alter the groundwater hydrology of the project site and vicinity through: (a) conversion of the landscape from very low-density rural residential/agriculture to a residential subdivision for 19 homes; (b) extraction of groundwater for domestic water supply; (c) onsite percolation of wastewater via leachfields; and (d) infiltration drainage/recharge of rainfall runoff in onsite detention/retention basins. The estimated changes in the hydrology are addressed through the completion of a water balance analysis, presented here, that compares existing conditions and future, post-development conditions.

A water balance analysis is an accounting model that tracks flows of water into and out of the particular hydrologic system of interest. For the proposed project, the analysis focuses on changes in the groundwater system in the immediate project vicinity. The change is evaluated by comparing the estimated amount of recharge, before and after, along with the amount of groundwater that will be extracted for project uses.

Rainfall-Recharge from Open Space/Landscaped Area

The existing site is predominantly naturally vegetated opens space, with a few small residential structures and unimproved dirt roads. There is no storm drainage system. Therefore, for a conservative hydrological analysis, the entire site can be considered to be open space. Under the proposed development, we estimate that about 75% of the site (36 acres) will remain as vegetated open space or landscaped area, with the remaining area occupied by paved roads, driveways, buildings, walkways and patios.

Direct percolation of rainfall on open space and landscaped areas is the most significant source of groundwater recharge under existing and future conditions. Estimation of rainfall-recharge was made by constructing a water budget, using monthly time steps and average climatic conditions. The water budget starts with the average monthly rainfall, subtracts the amount of rainfall estimated to run off during storm events, and then further subtracts from the remaining moisture the amount is that is taken up by vegetation or evaporation from the soil surface. The resultant of these calculations is the monthly amount of surplus water that accumulates in the soil up to the available water holding capacity based on soil properties. Excess water beyond the soil moisture holding capacity is the amount (per unit area) estimated to be available for percolation and recharge of the groundwater; this is sometimes referred to as "deep percolation". Data sources and assumptions used to construct the water budget are reviewed below.

Precipitation. Average monthly rainfall data were obtained from the Western Regional Climate Center (WRCC) for the two nearest reporting rainfall stations in the project area: (a) Salinas 2E (047668), and (b) Chittenden Pass (041739), which are similar distances from the project site - 8.5 and 7.5 miles, respectively. There are no reporting stations in Prundale. The average of the two stations was used to estimate the average monthly and total annual rainfall for the project area as shown in **Table 1** below.

Table 1. Average Rainfall in the Project Area (inches)

Location	Monthly Rainfall (in)												Total Annual Rainfall (in)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Salinas	2.87	2.70	2.29	1.13	0.30	0.09	0.03	0.06	0.22	0.65	1.72	2.47	**14.53**
Chittenden Pass	4.11	2.72	2.84	1.62	0.37	0.11	0.04	0.05	0.31	0.98	2.19	3.56	**18.90**
Project Site	3.49	2.71	2.57	1.38	0.34	0.10	0.04	0.06	0.27	0.82	1.96	3.02	**16.72**

Additionally, daily rainfall data were collected for water years (WY) 1995-96 and 1996-97 available for the Monterey Airport for use in the analysis of storm rainfall and runoff volumes, as discussed below under Surface Runoff.

Surface Runoff. Surface runoff volumes were estimated using the Natural Resources Conservation Service (NRCS) Curve Number method. This NRCS method classifies land use and soil type (by hydrologic group) by a single parameter called the Curve Number (CN), which is then used to estimate runoff for different storm amounts (i.e., inches of rainfall) as explained below.

First, a CN value of 71 was selected for the open space and landscaped areas of the site, based on the vegetation, slopes and soil conditions. Next, daily rainfall data were obtained for two near average rainfall years, WY 1995-96 (17.15 in) and WY 1996-97 (16.96), from the records for the Monterey Airport, which is the nearest representative weather station with sufficient daily rainfall data. The daily rainfall data were then reviewed to determine the rainfall totals for all individual storms. Using a CN of 71, the runoff amounts (in inches) for all individual storms were estimated and tallied for WY 1995-96 and 1996-97. The totals were then compared against (i.e., divided by) the total winter season (Nov-Apr) precipitation to determine the percent runoff. These calculations showed a total runoff volume equal to approximately 10% of the total winter rainfall for the two water years reviewed. In the water budget this factor was applied to the average monthly rainfall amounts to estimate the average monthly runoff. Supporting data and calculations are attached.

For the analysis of open space recharge volumes, it was assumed that surface runoff is independent and is either channeled in natural drainages (existing conditions) or through a storm drainage system for detention and retention or discharge from the site to downstream areas (developed condition).

Potential Evapotranspiration. The potential "reference" evapotranspiration rates (Et_o) for the project area were obtained from the California Irrigation Management and Information System (CIMIS), developed and operated by the State of California as a joint cooperative of the University of California at Davis and the Department of Water Resources. Monthly data from the nearest CIMIS station (Salinas North, #116) were used for project analysis as shown in **Table 2.**

Table 2. Average Potential Evapotranspiration, CIMIS Station Salinas North, #116

Average Potential Evapotranspiration, Et_o (in)												Average Annual Et_o (in)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1.56	1.93	3.11	4.09	4.50	4.92	4.44	4.21	3.56	2.87	1.84	1.47	38.50

Actual Evapotranspiration. Actual evapotranspiration rates for a given location vary from the potential evapotranspiration rate, depending upon local vegetative groundcover and other landscaping factors. Potential Et_o rates were adjusted using the landscape coefficient method. The landscape coefficient method, as presented by the Cooperative Extension, University of California, Division of Agriculture and Natural Resources, uses a single parameter, the landscape coefficient, as a function of the landscape species planted (species factor), the density of the vegetation (density factor), and the microclimatic conditions (microclimate factor).

$K_L = k_s \times k_d \times k_{mc}$, where:

k_s = species factor
k_d = density factor
k_{mc} = microclimate factor

The ET_o values obtained from CIMIS are for a K_L value of 1.0, representative of managed turf grass. The K_L value for the site was estimated using average values for each factor, based on published guidelines (see attached) for the mixed trees, shrubs and groundcovers that were judged to typify existing and future expected conditions for open space and landscaped areas of the site. The factors and resultant K_L value were as follows:

- k_s, "average" species factor = 0.5
- k_d, "average" density factor = 1.1
- k_{mc}, "average" microclimate factor = 1.0

- $K_L = 0.50 \times 1.1 \times 1.0 = 0.55$

Results. The spreadsheet displayed in **Table 3** gives the month-by-month water balance calculations. As indicated for the project site, our analysis shows an estimated annual recharge rate of about 3.31 inches of rainfall for the open space and landscaped areas. This translates to an annual recharge volume of 13.18 acre-ft per year (AFY) for the 47.8-acre site under existing conditions, and 9.93 AFY for the estimated 36 acres of open space/landscaped area under the proposed project.

Table 3. Rainfall-Recharge Water Balance for Open Space & Landscape Area

Month	Ave. Rainfall (in)[1]	Runoff (in)[2]	Net Available Rainfall (in)	Reference Et_o (in)	Adjusted Et (in)[3]	Soil Moisture Storage[4] (in)	Net Recharge (in/month)[5]
January	3.49	0.35	3.14	1.56	0.86	0.94	1.34
February	2.71	0.27	2.44	1.93	1.06	0.00	1.38
March	2.57	0.26	2.31	3.11	1.71	0.00	0.60
April	1.38	0.14	1.24	4.09	2.25	0.00	0.0
May	0.34	0.00	0.34	4.50	2.48	0.00	0.0
June	0.10	0.00	0.10	4.92	2.71	0.00	0.0
July	0.04	0.00	0.04	4.44	2.44	0.00	0.0
August	0.06	0.00	0.06	4.21	2.32	0.00	0.0
September	0.27	0.00	0.27	3.56	1.96	0.00	0.0
October	0.82	0.00	0.82	2.87	1.58	0.00	0.0
November	1.96	0.20	1.76	1.84	1.01	0.75	0.0
December	3.02	0.30	2.72	1.47	0.81	1.91	0.0
TOTALS	**16.72**	**1.52**	**15.20**	**38.50**	**21.18**	**3.60**	**3.31**

[1] Salinas 2 E Weather Station

[2] Assumes 10% runoff during winter months (Nov-Apr); no runoff during summer months.

[3] Eto adjusted by multiplying by K_L (0.55)

[4] Excess water goes to soil moisture storage, up to water holding capacity of the soil: (0.09 x 40" depth) = 3.60"

[5] Recharge = rainfall - runoff - adjusted E t- vol to soil storage

Wastewater Percolation

Wastewater percolation from onsite septic systems is estimated to be approximately 200 gallons per day (gpd), or 0.224 acre-feet per year (AFY) per residence. While some evapotranspiration may occur for very shallow leachfield systems or special designs intended to enhance evaptranspiration, standard systems are designed to rely entirely on percolation. Therefore, it is assumed that all flow from onsite septic systems will result in downward percolation of water that will eventually reach the groundwater. For the existing conditions there are three residences on the site, amounting to a total estimated groundwater recharge volume of 0.67 AFY. For the proposed development, there will be 19 residences with a total estimated groundwater recharge volume of 4.26 AFY.

Stormwater Retention-Percolation

The proposed project will create impervious surfaces for buildings, patios, driveways and roads. This will decrease the land area available for rainfall percolation and evapotranspiration losses. As previously noted, it is estimated that about 25% of the project site (11.8 acres) will be converted to impervious or semi-impervious surfaces. The runoff from these impervious surface areas, along with runoff from adjacent open space and landscaping areas will be channeled to two stormwater detention-retention basins on the southern (downstream) side of the site. These basins, covering a total area of roughly 20,000 square feet, have the potential to capture and induce percolation of significant amounts of runoff. Soil investigations and percolation testing have shown suitable

conditions at both locations, with the most favorable soil and percolation characteristics at the larger of the two basins. Testing in the area of the larger basin (adjacent to Lot 16) demonstrated percolation rates of 1 minute per inch (60 inches per hour) at a depth of five feet, and soils consisting of friable silty sand soils to a depth of 23.5 feet, indicating a high capacity for stormwater percolation. Testing in the smaller basin area adjacent to Lot 4 showed a percolation rate of 60 minutes per inch (1 inch per hour), indicating a moderate to low capacity for percolation of stormwater at this location. Ultimately, the amount of runoff that can be retained for percolation/recharge will depend on the actual sizing, design and management of these basins.

To confirm the feasibility of providing substantial retention-recharge of site runoff, example calculations were completed for the Basin 2 location, using actual daily rainfall amounts for the 2018-2019 water year (see **Attachment A)**. The analysis consisted of estimating daily runoff volume (acre-feet) from the Basin 2 drainage area for each daily rainfall amount (inches) and comparing the runoff volume against the daily percolation-recharge capacity of a given basin size (surface area) and depth. Based on the area tentatively designated by the applicant, a basin with 0.25 acres of percolation area (roughly 11,000 square feet) and available water storage depth of 3 feet was assumed as a reasonable size. Other assumptions and data used in the analysis included:

- Rainfall data was obtained from Monterey Peninsula Management District for the Santa Margarita rain gage near the Monterey Airport1. Total rainfall for 2018-2019 water year was 18.34 inches, reasonably close to the estimated annual rainfall of 16.72 inches for the project site.

- Basin 2 drainage area, under future/developed conditions, was assumed to consist of 7.6 acres of impervious surface area, 22.8 acres of open space and landscape area within the project area (pervious), plus 24.9 acres of adjacent open space area that drains through the project site to Basin 2.

- Runoff rates for impervious and pervious areas were assumed, respectively, to be 0.95 and 0.10; during summer months open space runoff was assumed to be nil.

- The long-term percolation-recharge rate for the Basin 2 soils was assumed, conservatively, to be 3 feet per day, which corresponds to an hourly rate of 1.5 inches per hour. This is a small fraction of the 60 inches per hour percolation rate obtained during field investigations and testing of the Basin 2 area.

- With an assumed surface area of 0.25 acres and 3 feet/day percolation capacity, the daily recharge capacity of the basin was assumed to be 0.75 acre-feet; daily runoff volumes up to 0.75 acre-feet were assumed to be retained and recharged, with volumes exceeding that amount assumed to overflow as excess runoff.

Two sets of runoff-recharge calculations were made: (1) for only the runoff originating within the project site in Drainage Basin 2; and (2) including runoff from the project site plus the runoff from the adjacent open space area that would drain to Basin 2. As shown in the attached calculation

1 https://www.mpwmd.net/wrd/rainfall/wy2019_sm_rain-2.txt

spreadsheets, considering only the project site contribution, projected daily runoff volumes from the Basin 2 drainage area were consistently within the 0.75 acre-feet per day recharge capacity, with only one exception - an estimated runoff volume of 1.03 acre-feet corresponding with a 1.25-inch daily rainfall total (November 29, 2018). The total annual runoff-recharge volume calculated from this analysis was 13.76 acre-feet for the 18.34 inches of total rainfall; this was reduced by 10 percent to give a projected annual volume of 12.38 acre-feet, corresponding with the lower average annual rainfall of 16.72 inches estimated for the project area. As shown in the second set of calculations, when the contribution from adjacent open space area is included, the net projected recharge volume increases to 14.76 acre-feet per year.

Based on the projected total annual runoff volume of 21.46 acre-feet per year for the entire project site, the estimated recharge volume provided by a 0.25-acre area at Basin 2 would amount to the following percentage of annual runoff volume:

(1) For project site runoff only: (12.38 ac-ft)/(21.46 ac-ft) = 58%
(2) Including runoff from adjacent open space: (14.76 ac-ft)/(21.46 ac-ft) = 69%

Based on this evaluation of potential stormwater percolation feasibility, we completed calculations for the conservative (safe) assumption that 50 percent of site runoff can be captured and retained for infiltration and percolation. For impervious surface areas this results in a potential infiltration volume of 8.36 inches per acre per year, assuming 100 percent of rainfall is collected from these areas. For open space and landscaped areas, since only 10 percent of the annual runoff is estimated to become runoff, 50 percent of this amount gives a projected recharge potential of 0.84 inches per acre per year for these areas of the site.

Groundwater Extraction (Pumping)

The water demand under existing and historical uses of the property are assumed to include the domestic water use for three residences and a former goat dairy operation. The residential water use is estimated to be about 360 gpd, or 0.4 AFY, which is cited as an assumed typical value for this area in the North Monterey County Hydrogeologic Study. For the proposed project, residential water demand is estimated, conservatively, at 500 gpd per residence, or about 0.56 AFY. This is consistent with the expected higher use rates for new, larger homes having more modern amenities and more extensive landscaping than most of the older homes in the project area. Based on information from the owner (Jeff LaTourette), the project site previously supported a goat dairy operation that had water demands on the order of about 3,600 gpd. All water for the existing and historical uses on the project site as well as the domestic needs for the proposed residential subdivision are supplied from the extraction of groundwater within or near the project site, including onsite wells for the existing uses, and Woodland Heights Mutual Water Company wells for the future uses.

Water Balance Summary

Incorporating the information from above, **Tables 4** and **5** present, respectively, the water balance summary for existing conditions and future conditions under the project, not including the stormwater retention-percolation component. **Table 6** presents the water balance summary for the project including the estimated contribution from percolation-recharge of 50% of site runoff. Based

on this analysis, without stormwater percolation-recharge the project would result in an estimated net reduction in groundwater recharge of approximately 5 AFY (**Table 5**). With stormwater basins developed and maintained to maximize percolation-recharge, the project would result in a net increase in groundwater recharge of approximately 5.6 AFY (**Table 6**).

Table 4. Estimated Net Contribution to Groundwater Recharge
Existing/Historical Conditions

Factor	***Assumptions/ Calculations***	***Average Annual Recharge (AFY)***
Recharge		
Open Space Rainfall Recharge	(47.8 ac)(3.31 in/yr)(1 ft/12")	13.18
Wastewater Percolation	(3 DU)(0.224 AFY/DU)	0.67
TOTAL RECHARGE		**13.85**
Groundwater Extraction		
Residential Uses (360 gpd)	(3 DU)(0.40 AFY/DU)	(-1.20)
Goat Dairy	3,600 gpd	(-4.03)
TOTAL EXTRACTION		**(-5.23)**
Net contribution to Groundwater Recharge		**8.62**

Table 5. Estimated Net Contribution to Groundwater Recharge
Future Conditions Without Stormwater Retention-Percolation

Factor	***Assumptions/ Calculations***	***Average Annual Recharge (AFY)***
Recharge		
Open Space Rainfall Recharge	(36)(3.31 in/yr)(1 ft/12")	9.93
Wastewater Percolation	(19 DU)(0.224 AFY/DU)	4.26
TOTAL RECHARGE		**14.19**
Groundwater Extraction		
Residential Uses (500 gpd)	(19 DU)(0.56 AFY/DU)	(-10.64)
TOTAL EXTRACTION		**(-10.64)**
Net contribution to Groundwater Recharge		**3.55**

Table 6. Estimated Net Contribution to Groundwater Recharge
Future Conditions Including Stormwater Retention-Percolation of 50% Site Runoff

Factor	*Assumptions/ Calculations*	*Average Annual Recharge (AFY)*
Recharge		
Open Space Rainfall Recharge	(36)(3.31 in/yr)(1 ft/12")	9.93
Wastewater Percolation	(19 DU)(0.224 AFY/DU)	4.26
Retention of Impervious Runoff	(11.8 ac)(16.72")(0.5)/(12"/ft)	8.22
Retention of Open Space Runoff	(36 ac)(16.72")(0.1)(0.5)/(12"/ft)	2.51
TOTAL RECHARGE		**24.92**
Groundwater Extraction		
Residential Uses (500 gpd)	(19 DU)(0.56 AFY/DU)	(-10.64)
TOTAL EXTRACTION		**(-10.64)**
Net contribution to Groundwater Recharge		**14.28**

NITRATE LOADING ANALYSIS

The following presents an analysis of potential nitrate loading effects on groundwater associated with residential onsite wastewater disposal systems for the proposed La Tourette Subdivision.

Methodology

The nitrate loading analysis was completed using an annual chemical-water balance analysis. The methodology followed is described in the publication "Predicting Groundwater Nitrate-Nitrogen Impacts" (Hantzsche and Finnemore, *Groundwater*, Vol. 30, No. 4, July-August 1992). According to this methodology, the long-term concentration of nitrate as nitrogen (NO_3-N or nitrate-nitrogen) in the upper saturated groundwater zone can be closely approximated by the quality of percolating recharge waters. The average concentration of nitrate-nitrogen in recharge water, n_r, is estimated using the following equation:

$$n_r = \frac{Wn_w(1-d) + Rn_b}{(W+R)}$$

where: n_r = resultant average concentration of NO_3-N in recharge water, mg/l

W = annual volume rate of wastewater entering the soil averaged, acre-ft/yr (AFY)

n_w = total nitrogen concentration of wastewater, mg/l

n_b = background NO_3-N concentration of rainfall recharge at the water table, exclusive of wastewater influences, mg/l

d = fraction of NO_3-N loss due to denitrification of the soil

R = average annual volume of rainfall recharge in sub-basin area, AFY

Data and Assumptions

Per the equation presented above, resultant nitrate concentration in the groundwater is estimated to be the weighted average or combined concentration due to wastewater loading and deep percolation of rainfall contributed from the watershed (recharge) area within the area of concern. In this case the proposed project involves 19 individual septic systems dispersed uniformly throughout the project site; therefore, the recharge area of concern includes the entire project site. The analysis includes nitrate-nitrogen contributions from the 19 individual septic systems plus a factor representing background nitrate concentrations associated with percolating rainfall in the open space areas. Calculations were also made for a 17-lot subdivision, which has been identified as a project alternative. The rainfall-recharge includes rainfall percolation in open space and landscape areas plus

the induced infiltration and percolation of rainfall-runoff via retention basins. The following summarize the various assumptions.

- **Recharge Area.** The recharge area for the analysis is the 47.8-acre project site.

- **Groundwater Flow.** In a regional context, the direction of groundwater movement beneath the site is assumed to be generally in a westerly or southwesterly direction. Locally and in the upper groundwater zones, there is likely a groundwater flow component in a southerly direction, following the surface topography that runs north to south in the project area toward Pesante Road.

- **Wastewater Flows.** The nitrate loading analysis was completed for a wastewater flow assumption of 200 gpd per residence. This equates to a total daily flow of 3,800 gpd, or 4.26 ac-ft/yr for the proposed 19-lot project. Wastewater flows for the 17-lot project alternative were assumed to be 3,400 gpd, or 3.81 ac-ft/yr.

- **Wastewater Nitrogen Concentrations.** Total nitrogen concentration in wastewater effluent was assumed to be in the range of 60 to 65 mg/L, which is typical for domestic wastewater following primary (septic tank) treatment corresponding with normal unit wastewater flows in the range of 50 to 75 gpd per person; calculations were made for both values. For the reduced 17-lot project alternative, a lower nitrogen concentration (50% of that for septic tank effluent) was assigned to the one existing/remainder parcel; this was under the assumption that it would be permitted to utilize a supplemental wastewater treatment unit, which is permitted by County code for existing lots, but not for new lot creation.

- **Background Nitrogen Concentration.** Water quality sampling data for the nearby community wells operated by the Woodlland Heights Mutual Water Company were reviewed as a basis for estimating background groundwater nitrate concentrations. The wells are reported to have nitrate concentrations in the range of 2 to 4 mg/L, which equate to nitrate-nitrogen concentrations of 0.5 to 1 mg/L. Therefore, a concentration of 1.0 mg-N/L was selected for the analysis.

- **Soil Denitrification.** Total nitrogen removal in the upper soil zones via denitrification was estimated to be in the range of 15 to 25 percent of the total nitrogen in the effluent. Shallow leachfields tend to provide greater potential for nitrogen removal, are a requirement for the project area. Accordingly, calculations were made for assumptions of 15, 20 and 25 percent denitrification.

- **Deep Percolation (Recharge).** Deep percolation was estimated through completion of a water balance analysis (see Water Balance Analysis section), which takes into account rainfall, runoff, wastewater discharges, evapotranspiration losses and soil moisture storage. Under developed conditions, the recharge from direct rainfall percolation on open space and landcaped areas is estimated to be 3.31 inches per acre per year, or about 9.93 ac-ft for the estimated 36 acres of open space/landscaped area. Also, runoff from roads, buildings, and other impervious or semi-impervious areas will be collected in stormwater retention-detention basins, which are intended to be constructed and managed to provide additional

infiltration and recharge of stormwater runoff that would otherwise leave the site. The ultimate capacity for infiltration and recharge of stormwater will depend on the size and design of the stormwater basins. While preliminary analysis indicates a 50% infiltration rate to be feasible and realistic, for the purposes of this nitrate loading analysis, a range of potential stormwater recharge rates (25%, 50% and 75%) were evaluated to show the effects on the resultant nitrate-nitrogen concentration. For the estimated 11.8 acres of impervious and semi-impervious area, the estimated annual recharge volume for different recharge rates is:

- ✓ @ 25%: (0.25)(16.72 in/yr)(11.8 acres)/(12 in/ft) = 4.11 ac-ft/yr
- ✓ @ 50%: (0.50)(16.72 in/yr)(11.8 acres)/(12 in/ft) = 8.22 ac-ft/yr
- ✓ @ 75%: (0.75)(16.72 in/yr)(11.8 acres)/(12 in/ft) = 12.33 ac-ft/yr

The stormwater retention basins will also collect and potentially recharge runoff from the estimated 36 acres of open space/landscaped area within the project. Runoff from these areas is estimated to be 10% of rainfall; therefore, the additional potential recharge contribution from these areas for 25%, 50% and 75% capture rates is as follows:

- ✓ @ 25%: (0.25)(16.72 in/yr)(0.10)(36 acres)/(12 in/ft) = 1.25 ac-ft/yr
- ✓ @ 50%: (0.50)(16.72 in/yr)(0.10)(36 acres)/(12 in/ft) = 2.51 ac-ft/yr
- ✓ @ 75%: (0.75)(16.72 in/yr)(0.10)(36 acres)/(12 in/ft) = 3.76 ac-ft/yr

These volumes were added to the open space/landscaped area recharge component to arrive at total estimated annual recharge volumes for the different stormwater management scenarios.

Results

Based upon the assumptions and data provided above, the resultant average groundwater nitrate-nitrogen concentrations for the 19-lot project and 17-lot alternative were calculated for the indicated range of assumptions. Calculations in spreadsheet form are provided in **Attachment B**, with results summarized in **Table 7**.

Discussion

The analysis shows that the project will increase the nitrate-nitrogen concentration in the groundwater beneath the project site to levels of 7 mg-N/L or higher, depending on the amount of stormwater percolation-recharge that can be achieved at the proposed detention basins. The analysis indicates that 25% stormwater recharge would not be sufficient to prevent resultant groundwater-nitrate levels from reaching the drinking water limit of 10 mg-N/L beneath the site.

Stormwater recharge rates of 50% or more would be the minimum necessary to provide reasonable assurance of maintaining resultant groundwater nitrogen impacts below 10 mg-N/L. Design and operating plans for the detention basins should include measures to enhance percolation and recharge to the maximum extent practicable.

The results also show that nitrogen loading impacts could be decreased a small amount (approximately 10 to 12 percent) by reducing the number of lots from 19 to 17 and incorporating higher/supplemental level of wastewater treatment (nitrogen removal) for the one existing/remainder parcel.

Table 7.
Resultant Groundwater-Nitrate Loading Concentrations, mg-N/L
For 19-Lot and 17-Lot Project Alternatives

Percentage of Stormwater Recharge	Soil Denitrification Rate (%)	Total Nitrogen Concentration in Septic Tank Effluent			
		60 mg-N/L		65 mg-N/L	
		19 Lots	17 Lots*	19 Lots	17 Lots*
25%	15	11.89	10.38	12.81	11.48
	20	11.23	9.81	12.10	10.85
	25	10.58	9.25	11.40	10.22
50%	15	9.54	8.32	10.27	9.18
	20	9.03	7.88	9.71	8.69
	25	8.52	7.44	9.16	8.20
75%	15	8.03	7.00	8.63	7.71
	20	7.61	6.64	8.17	7.31
	25	7.19	6.28	7.71	6.90

*Includes assumption of supplemental treatment (50% nitrogen removal) on one existing parcel.

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Attachment A

Stormwater Retention Calculations

Runoff-Retention Calculations for Stormwater Basin 2 - Project Site Only, Drainage Basin 2

Day	2018												2019																								
	Oct				Nov				Dec				Jan				Feb				Mar				Apr				May				Jun	Jul	Aug	Sep				Annual
	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Rainfall	Rainfall	Rainfall	Runoff	Recharge	Excess Runoff	
	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft				inches	ac-ft	ac-ft	ac-ft	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.04	0.03	0.03	0.00	0.08	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.72	0.72	0.00	0.24	0.19	0.19	0.00	0.01	0.01	0.01	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	0.10	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.25	0.25	0.00	0.13	0.10	0.10	0.00	0.02	0.02	0.02	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	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.11	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.77	0.61	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.09	0.09	0.00	0.18	0.14	0.14	0.00	0.08	0.06	0.06	0.00	0.22	0.17	0.17	0.00	0.09	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.31	0.31	0.00	0.01	0.01	0.01	0.00	0.15	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.08	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.36	0.29	0.29	0.00	0.00	0.00	0.00	0.00	0.05	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.63	0.63	0.00	0.13	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.21	0.21	0.00	0.17	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.47	0.47	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.07	0.07	0.00	0.43	0.34	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.18	0.18	0.00	0.53	0.42	0.42	0.00	0.00	0.00	0.00	0.00	0.15	0.12	0.12	0.00	0.33	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.57	0.57	0.00	0.44	0.35	0.35	0.00	0.39	0.31	0.31	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.47	0.28	0.28	0.00	0.00	0.00	0.00	0.10	0.06	0.06	0.00	
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.04	0.03	0.03	0.00	0.43	0.34	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.27	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.73	0.44	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.11	0.11	0.00	0.07	0.06	0.06	0.00	0.55	0.44	0.44	0.00	0.02	0.02	0.02	0.00	0.06	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
21	0.00	0.00	0.00	0.00	0.18	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
22	0.00	0.00	0.00	0.00	0.21	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
23	0.00	0.00	0.00	0.00	0.17	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.23	0.23	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
24	0.00	0.00	0.00	0.00	0.07	0.06	0.06	0.00	0.19	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
28	0.00	0.00	0.00	0.00	0.86	0.68	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.10	0.10	0.00	0.05	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
29	0.00	0.00	0.00	0.00	1.25	0.99	0.75	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
30	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
31	0.00	0.00	0.00	0.00					0.00	0.00	0.00	0.00	0.65	0.51	0.51	0.00	0.00				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	0.12	0.07	0.07	0.00	2.75	2.18	1.94	0.24	1.35	1.07	1.07	0.00	2.50	1.98	1.98	0.00	5.99	4.74	4.74	0.00	2.69	2.13	2.13	0.00	0.32	0.25	0.25	0.00	2.52	1.52	1.52	0.00	0.00	0.00	0.00	0.10	0.06	0.06	0.00	
Total Recharge			0.07				1.94				1.07				1.98				4.74				2.13				0.25				1.52						0.06		13.76
																																						Adjusted for 16.72" ave annual rainfall at project site (90%)			12.38

Notes and Assumptions:

Retention Basin Surface Recharge Area: 0.25 acres
Minimum Basin Storage Depth: 3.0 feet
Permeability, ft per day: 3 ft/day (1.5 inches/hr)
Daily recharge capacity: 0.75 acre-feet
Imperious Area, Basin 2: 7.6 acres
Impervious Area Runoff Rate: 0.95 (remainder lost to evaporation at source or at retention basin)
Open Space/Landscap, Basin 2: 22.8 acres (project site only)
Open Space/Landscape, Runoff Rate: 0.1 (Apr to Nov only)
Daily rainfall data: Monterey Penninsula Water Management District, Santa Margarita Gage, WY 2019, - 18.34 inches annual total
https://www.mpwmd.net/wrd/rainfall/wy2019_sm_rain-2.txt

Runoff-Retention Calculations for Stormwater Basin 2 - Including Project Site Plus Contribution from Adjacent Open Space Area, Drainage Basin 2

Day	2018												2019																								
	Oct				Nov				Dec				Jan				Feb				Mar				Apr				May				Jun	Jul	Aug	Sep				Annual
	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Runoff	Recharge	Excess Runoff	Rainfall	Rainfall	Rainfall	Rainfall	Runoff	Recharge	Excess Runoff	
	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft	inches	ac-ft	ac-ft	ac-ft				inches	ac-ft	ac-ft	ac-ft	
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.1	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.04	0.00	0.08	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.91	0.75	0.16	0.24	0.24	0.24	0.00	0.01	0.01	0.01	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	0.10	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.32	0.32	0.00	0.13	0.13	0.13	0.00	0.02	0.02	0.02	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	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.77	0.77	0.75	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.11	0.00	0.18	0.18	0.18	0.00	0.08	0.08	0.08	0.00	0.22	0.22	0.22	0.00	0.09	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39	0.39	0.00	0.01	0.01	0.01	0.00	0.15	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.08	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.36	0.36	0.36	0.00	0.00	0.00	0.00	0.00	0.05	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.80	0.75	0.05	0.13	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.27	0.27	0.00	0.17	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.59	0.59	0.00	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.09	0.00	0.43	0.43	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.23	0.00	0.53	0.53	0.53	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.15	0.00	0.33	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.72	0.72	0.00	0.44	0.44	0.44	0.00	0.39	0.39	0.39	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.00	0.47	0.28	0.28	0.00	0.00	0.00	0.00	0.10	0.06	0.06	0.00	
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.06	0.00	0.04	0.04	0.04	0.00	0.43	0.43	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.27	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.73	0.44	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.14	0.00	0.07	0.07	0.07	0.00	0.55	0.55	0.55	0.00	0.02	0.02	0.02	0.00	0.06	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
21	0.00	0.00	0.00	0.00	0.18	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
22	0.00	0.00	0.00	0.00	0.21	0.21	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
23	0.00	0.00	0.00	0.00	0.17	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
24	0.00	0.00	0.00	0.00	0.07	0.07	0.07	0.00	0.19	0.19	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
28	0.00	0.00	0.00	0.00	0.86	0.86	0.75	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.12	0.00	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
29	0.00	0.00	0.00	0.00	1.25	1.25	0.75	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
30	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
31	0.00	0.00	0.00	0.00					0.00	0.00	0.00	0.00	0.65	0.65	0.65	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	0.12	0.07	0.07	0.00	2.75	2.75	2.14	0.61	1.35	1.35	1.35	0.00	2.50	2.50	2.50	0.00	5.99	5.99	5.76	0.23	2.69	2.69	2.69	0.00	0.32	0.32	0.32	0.00	2.52	1.52	1.52	0.00	0.00	0.00	0.00	0.10	0.06	0.06	0.00	
Total Recharge			**0.07**				**2.14**				**1.35**				**2.50**				**5.76**				**2.69**				**0.32**				**1.52**						**0.06**		**16.40**
																																						Adjusted for 16.72" ave annual rainfall at project site (90%)		**14.76**

Notes and Assumptions:

Retention Basin Surface Recharge Area: 0.25 acres
Minimum Basin Storage Depth: 3.0 feet
Permeability, ft per day: 3 ft/day (1.5 inches/hr)
Daily recharge capacity: 0.75 acre-feet
Imperious Area, Basin 2: 7.6 acres
Impervious Area Runoff Rate: 0.95 (remainder lost to evaporation at source or at retention basin)
Open Space/Landscap, Basin 2: 47.7 acres (project site plus adjacent offsite open space)
Open Space/Landscape, Runoff Rate: 0.1 (Apr to Nov only)
Daily rainfall data: Monterey Penninsula Water Management District, Santa Margarita Gage, WY 2019, - 18.34 inches annual total
https://www.mpwmd.net/wrd/rainfall/wy2019_sm_rain-2.txt

Attachment B
Nitrate Loading Calculations

Wastewater Nitrogen Loading Analysis - La Tourette Subdivision

Wastwater Flow & Nitrogen Mass Loading

Average wastewater flow; 200 gpd per residence, for 19 lots: **3,800 gpd**
Total effluent nitrogen concentration: Calculate for **60 and 65 mg-N/L**
Assumed nitrogen assimilation by adsorption and denitrifiation: **15%, 20%, 25%**

Site Characteristics & Assumptions

Rainfall-Recharge Area: Total Site**: 47.8**
Proposed Development - Impervious Area: 25%, **11.8 acres**
Proposed Devlopment - Pervious open space & landscaping: **36 acres**
Net annual rainfall deep percolation-recharge (per water balance): 3.31"
Detention Basin Recharge assumptions: **25%, 50%, 75%**

Water Quality Criteria/Limits

Groundwater nitrate-N drinking water standard: 10 mg-N/L

Table N-1. Nitrate-N Loading Calculations, 15% denitrification

Wastewater					Average Rainfall Recharge (36 ac open space and landscape)			Stormwater Retention (11.8 ac impervious)			Open Space Runoff Retention	Total Rain and Storm water Retention	Background Nitrogen, N_B	Resultant Groundwater-N Concentration	
Flow		Effluent Total N_w		Denit.	Recharge Area	Annual Recharge at 3.31" per year		Rainfall (16.72")	Percentage Retained	Net Recharge				(a) 60 mg/L	(b) 65 mg/L
gpd	ac-ft/yr	(a) mg-N/L	(b) mg-N/L	(fraction)	Acres	feet	ac-ft	ft/yr	fraction	ac-ft	ac-ft	ac-ft	mg-N/L	mg-N/L	mg-N/L
3,800	4.26	60	65	0.15	36.0	0.28	9.93	1.39	0.25	4.11	1.25	15.29	1	11.89	12.81
3,800	4.26	60	65	0.15	36.0	0.28	9.93	1.39	0.50	8.22	2.51	20.66	1	9.54	10.27
3,800	4.26	60	65	0.15	36.0	0.28	9.93	1.39	0.75	12.33	3.76	26.02	1	8.03	8.63

Table N-2. Nitrate-N Loading Calculations - 20% denitrification

Wastewater					Average Rainfall Recharge (36 ac open space and landscape)			Stormwater Retention (11.8 ac impervious)			Open Space Runoff Retention	Total Rain and Storm water Retention	Background Nitrogen, N_B	Resultant Groundwater-N Concentration	
Flow		Effluent Total N_w		Denit.	Recharge Area	Annual Recharge at 4.16" per year		Rainfall (16.72")	Percentage Retained	Net Recharge				(a) 60 mg/L	(b) 65 mg/L
gpd	ac-ft/yr	(a) mg-N/L	(b) mg-N/L	(fraction)	Acres	feet	ac-ft	ft/yr	fraction	ac-ft	ac-ft	ac-ft	mg-N/L	mg-N/L	mg-N/L
3,800	4.26	60	65	0.20	36.0	0.28	9.93	1.39	0.25	4.11	1.25	15.29	1	11.23	12.10
3,800	4.26	60	65	0.20	36.0	0.28	9.93	1.39	0.50	8.22	2.51	20.66	1	9.03	9.71
3,800	4.26	60	65	0.20	36.0	0.28	9.93	1.39	0.75	12.33	3.76	26.02	1	7.61	8.17

Table N-3. Nitrate-N Loading Calculations - 25% denitrification

Wastewater					Average Rainfall Recharge (36 ac open space and landscape)			Stormwater Retention (11.8 ac impervious)			Open Space Runoff Retention	Total Rain and Storm water Retention	Background Nitrogen, N_B	Resultant Groundwater-N Concentration	
Flow		Effluent Total N_w		Denit.	Recharge Area	Annual Recharge at 4.16" per year		Rainfall (16.72")	Percentage Retained	Net Recharge				(a) 60 mg/L	(b) 65 mg/L
gpd	ac-ft/yr	(a) mg-N/L	(b) mg-N/L	(fraction)	Acres	feet	ac-ft	ft/yr	fraction	ac-ft	ac-ft	ac-ft	mg-N/L	mg-N/L	mg-N/L
3,800	4.26	60	65	0.25	36.0	0.28	9.93	1.39	0.25	4.11	1.25	15.29	1	10.58	11.40
3,800	4.26	60	65	0.25	36.0	0.28	9.93	1.39	0.50	8.22	2.51	20.66	1	8.52	9.16
3,800	4.26	60	65	0.25	36.0	0.28	9.93	1.39	0.75	12.33	3.76	26.02	1	7.19	7.71

Wastewater Nitrogen Loading Analysis - La Tourette Subdivision_17 lots, 1 at 50% N

Wastwater Flow & Nitrogen Mass Loading

Average wastewater flow; 200 gpd per residence, for 17 lots: **3,400 gpd**
Total effluent nitrogen concentration: Calculate for **60 and 65 mg-N/L**
Assumed nitrogen assimilation by adsorption and denitrifiation: **15%, 20%, 25%**

Site Characteristics & Assumptions

Rainfall-Recharge Area: Total Site**: 47.8**
Proposed Development - Impervious Area: 25%, **11.8 acres**
Proposed Devlopment - Pervious open space & landscaping: **36 acres**
Net annual rainfall deep percolation-recharge (per water balance): 3.31**"**
Detention Basin Recharge assumptions: **25%, 50%, 75%**

Water Quality Criteria/Limits

Groundwater nitrate-N drinking water standard: 10 mg-N/L

Table N-1. Nitrate-N Loading Calculations, 15% denitrification

Wastewater					Average Rainfall Recharge (36 ac open space and landscape)			Stormwater Retention (11.8 ac impervious)			Open Space Runoff Retention	Total Rain and Storm water Retention	Background Nitrogen, N_B	Resultant Groundwater-N Concentration	
Flow		Effluent Total N_w		Denit.	Recharge Area	Annual Recharge at 3.31" per year		Rainfall (16.72")	Percentage Retained	Net Recharge				(a) 60 mg/L	(b) 65 mg/L
gpd	ac-ft/yr	(a) mg-N/L	(b) mg-N/L	(fraction)	Acres	feet	ac-ft	ft/yr	fraction	ac-ft	ac-ft	ac-ft	mg-N/L	mg-N/L	mg-N/L
3,400	3.81	60	65	0.15	36.0	0.28	9.93	1.39	0.25	4.11	1.25	15.29	1	10.97	11.82
3,400	3.81	56.5	63	0.15	36.0	0.28	9.93	1.39	0.50	8.22	2.51	20.66	1	8.32	9.18
3,400	3.81	56.5	63	0.15	36.0	0.28	9.93	1.39	0.75	12.33	3.76	26.02	1	7.00	7.71

Table N-2. Nitrate-N Loading Calculations - 20% denitrification

Wastewater					Average Rainfall Recharge (36 ac open space and landscape)			Stormwater Retention (11.8 ac impervious)			Open Space Runoff Retention	Total Rain and Storm water Retention	Background Nitrogen, N_B	Resultant Groundwater-N Concentration	
Flow		Effluent Total N_w		Denit.	Recharge Area	Annual Recharge at 4.16" per year		Rainfall (16.72")	Percentage Retained	Net Recharge				(a) 60 mg/L	(b) 65 mg/L
gpd	ac-ft/yr	(a) mg-N/L	(b) mg-N/L	(fraction)	Acres	feet	ac-ft	ft/yr	fraction	ac-ft	ac-ft	ac-ft	mg-N/L	mg-N/L	mg-N/L
3,400	3.81	56.5	63	0.20	36.0	0.28	9.93	1.39	0.25	4.11	1.25	15.29	1	9.81	10.85
3,400	3.81	56.5	63	0.20	36.0	0.28	9.93	1.39	0.50	8.22	2.51	20.66	1	7.88	8.69
3,400	3.81	56.5	63	0.20	36.0	0.28	9.93	1.39	0.75	12.33	3.76	26.02	1	6.64	7.31

Table N-3. Nitrate-N Loading Calculations - 25% denitrification

Wastewater					Average Rainfall Recharge (36 ac open space and landscape)			Stormwater Retention (11.8 ac impervious)			Open Space Runoff Retention	Total Rain and Storm water Retention	Background Nitrogen, N_B	Resultant Groundwater-N Concentration	
Flow		Effluent Total N_w		Denit.	Recharge Area	Annual Recharge at 4.16" per year		Rainfall (16.72")	Percentage Retained	Net Recharge				(a) 60 mg/L	(b) 65 mg/L
gpd	ac-ft/yr	(a) mg-N/L	(b) mg-N/L	(fraction)	Acres	feet	ac-ft	ft/yr	fraction	ac-ft	ac-ft	ac-ft	mg-N/L	mg-N/L	mg-N/L
3,400	3.81	56.5	63	0.25	36.0	0.28	9.93	1.39	0.25	4.11	1.25	15.29	1	9.25	10.22
3,400	3.81	56.5	63	0.25	36.0	0.28	9.93	1.39	0.50	8.22	2.51	20.66	1	7.44	8.20
3,400	3.81	56.5	63	0.25	36.0	0.28	9.93	1.39	0.75	12.33	3.76	26.02	1	6.28	6.90

Appendix L

Traffic Analysis

Keith Higgins
Traffic Engineer

LATOURETTE SUBDIVISION
TRAFFIC IMPACT ANALYSIS

DRAFT REPORT

PRUNEDALE, CALIFORNIA

Prepared for

Jeff LaTourette

Prepared by
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October 4, 2017

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 Project Description 1
1.2 Scope of Work 1
1.3 Traffic Operation Evaluation Methodologies and LOS Standards 2
1.4 Criteria for Project Impacts 3
1.5 Funding for Transportation Improvements 4
2 EXISTING CONDITIONS 6
2.1 Existing Road Network 6
2.2 Existing Transit Service 7
2.3 Existing Bicycle and Pedestrian Facilities 7
2.4 Existing Conditions Intersection Operations 8
2.5 Existing Conditions Road Segment Operations 8
3 EXISTING PLUS PROJECT CONDITIONS 10
3.1 Project Trip Generation, Distribution and Assignment 10
3.2 Existing Plus Project Conditions Intersection Operations 10
3.3 Existing Plus Project Conditions Road Segment Operations 10
3.4 Existing Plus Project Conditions Impacts 10
4 CUMULATIVE WITHOUT PROJECT CONDITIONS 11
4.1 Cumulative Without Project Traffic Volumes 11
4.2 Cumulative Without Project Conditions Intersection Operations 11
4.3 Cumulative Without Project Conditions Road Segment Operations 11
5 CUMULATIVE PLUS PROJECT CONDITIONS 12
5.1 Cumulative Plus Project Intersection Operations 12
5.2 Cumulative Plus Project Road Segment Operations 12
5.3 Cumulative Plus Project Conditions Impacts 13
6 BLACKIE ROAD INTERSECTION GEOMETRIC ANALYSIS 14
6.1 Prunedale South Road / Blackie Road Geometric Analysis 14
6.2 Southbound US 101 / Blackie Road Geometric Analysis 14
6.3 Summary of Blackie Road Geometric Analysis 15

7 PROJECT ACCESS 16

7.1 On-Site Circulation 16

8 CONCLUSIONS AND RECOMMENDATIONS 18

8.1 Concluding Comments 18

8.2 Existing Plus Project Traffic Conditions 18

8.3 Cumulative Plus Project Traffic Conditions 18

8.4 Project Mitigation Measures 18

EXHIBITS

Exhibit 1 – Project Location Map
Exhibit 2 – Project Site Plan
Exhibit 3 – Project Study Area
Exhibit 4 – Existing Conditions AM and PM Peak Hour Volumes
Exhibit 5 – Intersection Levels of Service
Exhibit 6 – Caltrans ADT Trends on US 101 between SR 156 and Boronda Road
Exhibit 7 – Road Segment Levels of Service
Exhibit 8 – Project Trip Generation
Exhibit 9 – Project Trip Assignment AM and PM Peak Hour Volumes
Exhibit 10 – Existing Plus Project Conditions AM and PM Peak Hour Volumes
Exhibit 11 – Cumulative Projects Trip Generation
Exhibit 12 – Cumulative Without Project Conditions AM and PM Peak Hour Volumes
Exhibit 13 – Cumulative Plus Project Conditions AM and PM Peak Hour Volumes
Exhibit 14 – Project Access Road Analysis

APPENDICES

A. Level of Service Descriptions (A-1 through A-4)
B. Traffic Count Data
C. Level of Service Calculations (C-1 Intersections, C-2 Segments)
D. Cumulative Projects Location Map
E. Blackie Road Intersection Alignments
F. Prunedale South Rd / Blackie Rd WB-40 Truck Turning Template
G. Prunedale South Rd / Blackie Rd CA Legal-50 Truck Turning Template
H. Prunedale South Rd / Blackie Rd STAA Standard Truck Turning Template
I. SB US 101 / Blackie Rd WB-40 Truck Turning Template
J. SB Us 101 / Blackie Rd CA Legal-50 Truck Turning Template
K. SB US 101 / Blackie Rd STAA Standard Truck Turning Template

1 INTRODUCTION

This report presents the results of the Traffic Impact Analysis (TIA) performed to evaluate the potential traffic impacts associated with the development of the proposed LaTourette Subdivision project. The project is located north of Pesante Road and east of US Highway 101 in North Monterey County, California.

1.1 Project Description

The proposed project is a 19-lot single-family residential subdivision on a 46.37-acre parcel. The primary access to the residential lots will be via a 22-foot wide private road that will extend to the existing Woodland Heights Place. The project will also have a 13-foot wide emergency access road that will extend to North King Road and will also provide access to two of the residential lots. Another 13-foot wide road within the subdivision will provide access to three or four of the lots. The project location map is included as **Exhibit 1**. The proposed project site plan is shown in **Exhibit 2**.

1.2 Scope of Work

This traffic study analyzed the project's potential traffic impacts on the local roadways and intersections. The scope of work for the traffic study was developed through consultation with Monterey County Department of Public Works staff.

Study intersections and road segments were analyzed for the weekday morning (i.e., 7:00 to 9:00 a.m.) and evening (i.e., 4:00 to 6:00 p.m.) peak periods. Recommendations for mitigation measures to offset the traffic impacts from the proposed project are also provided. The study included the following intersections and road segments:

Intersections:

1. North King Road / Woodland Heights Place
2. North King Road / Pesante Road
3. Cross Road / Pesante Road
4. Northbound US 101 / Pesante Road
5. Prunedale South Road / Blackie Road
6. Southbound US 101 / Blackie Road
7. Reese Circle / Cross Road
8. Reese Circle / Prunedale South Road
9. Pollock Lane / Pesante Road
10. Northbound US 101 / Reese Circle
11. Pollock Lane / Cross Road

Roadway Segments:

1. US 101 between US 156 and Pesante Road
2. US 101 between Pesante Road and Sala Road

3. US 101 between Sala Road and Boronda Road
4. Blackie Road between Prunedale South Road and US 101
5. Prunedale South Road between Blackie Road and Reese Circle
6. Reese Circle between Prunedale South Road and Cross Road
7. Cross Road between Reese Circle and Pollock Lane
8. Cross Road between Pollock Lane and Pesante Road
9. Pesante Road between US 101 and Cross Road
10. Pesante Road between Cross Road and North King Road
11. North King Road north of Pesante Road
12. Reese Circle between US 101 and Cross Road

Traffic operations for the following development scenarios were analyzed:

Existing Conditions
Existing Plus Project Conditions
Cumulative Without Project Conditions
Cumulative Plus Project Conditions

Cumulative Without Project traffic volumes are based on the 2030 Cumulative Conditions scenario within the 2010 Monterey County General Plan. The 2030 Cumulative Without Project traffic volumes include traffic generated by other projects proposed along the Pesante Road corridor.

1.3 Traffic Operation Evaluation Methodologies and LOS Standards

Traffic Operation Evaluation Methodologies

Intersection and road segment traffic operations were evaluated based on the Level of Service (LOS) concept, and the LOS standard adopted by the jurisdiction in which the facility is located. LOS is a qualitative description of an intersection's or road segment's operation, ranging from LOS A to LOS F. Level of service "A" represents free flow un-congested traffic conditions. Level of service "F" represents highly congested traffic conditions with what is commonly considered unacceptable delay to vehicles. The intermediate levels of service represent incremental levels of congestion and delay between these two extremes.

The Northbound US 101 / Pesante Road (#4), Southbound US 101 / Blackie Road (#6), and Northbound US 101 / Reese Circle (#10) intersections were evaluated using the HCS analysis software based on Highway Capacity Manual (HCM) 2010 methodologies for freeway merge and diverge areas. Merge/diverge operations are based on density in passenger cars per mile per lane (pc/mi/ln). LOS descriptions for merge and diverge areas are included in **Appendix A-1**.

The Prunedale South Road / Blackie Road intersection (#5) was evaluated using the Synchro analysis software based on HCM 2010 methodologies for signalized intersections. Intersection operations are based upon the average vehicular delay at the intersection. The average delay is then correlated to a level of service. When using the HCM 2010 method for the analysis of

signalized intersections, the overall intersection delay is used to determine LOS. LOS descriptions for signalized intersections are included in **Appendix A-2**.

Operations for the remaining study intersections were evaluated using the Synchro analysis software based on HCM 2010 methodologies for one- and two-way stop controlled intersections. At one- or two-way stop-controlled intersections, only the side street approaches must stop before entering the intersection; traffic on the major street is allowed to pass freely through the intersection. The side-street delay (and corresponding level of service) is therefore the criteria used to evaluate the intersection. LOS descriptions for one- and two-way stop controlled intersections are included in **Appendix A-3**.

The US 101 study segments (#1, #2 and #3) were evaluated using the HCS analysis software based on HCM 2010 methodologies for basic freeway segments. LOS for freeway segments is based on density in passenger vehicles per mile per lane (pc/mi/ln). The LOS criteria for freeway segments are included in **Appendix A-4**. The remaining study segments (#4 - #12), all of which are County road segments, were evaluated based on threshold volumes in the 2010 Monterey County General Plan.

Level of Service Standards

Caltrans Level of Service Standards

Intersections #4, #6 and #10, and road segments #1, #2, and #3 fall under the jurisdiction of Caltrans. Per the *Caltrans Guide for Preparation of Traffic Impact Studies* publication, “Caltrans endeavors to maintain a target LOS at the transition between LOS “C” and LOS “D” on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained.” MOE refers to the measures of effectiveness which are used to describe the measures best suited for analyzing State highway facilities.

Monterey County Level of Service Standards

Intersections #1 - #3, #5, #7 - #9, and #11, and road segments #4 - #12 fall under the jurisdiction of Monterey County. The Monterey County General Plan has established LOS D as the minimum acceptable level of service for signalized intersections and road segments. LOS E is considered the maximum acceptable level of service for unsignalized intersections (based on the delay at the worst approach for one- and two-way stop controlled intersections and the average delay at all-way stop and roundabout controlled intersections).

1.4 Criteria for Project Impacts

According to California Environmental Quality Act (CEQA) guidelines, a project may have a significant effect on the environment if it would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system. In accordance with CEQA, impact criteria have been applied to determine if the project-specific increase in traffic is substantial in relation to the existing traffic load and capacity of the street system.

Monterey County Impact Criteria

An impact at a **signalized study intersection** is defined to occur under the following conditions:

> An impact would occur if an intersection operating at LOS A, B, C, or D degrades by one or more letter grades to LOS E or F. For intersections already operating at LOS E, an impact would occur if operations degrade to LOS F. For intersections already operating at LOS F, the addition of any project traffic to the facility is considered an impact.

An impact at an **unsignalized study intersection** is defined to occur under the following conditions:

> An impact would occur if an **all-way stop controlled** or **roundabout controlled** intersection, based on the average delay, operates at LOS F or any traffic signal warrant is met.
> An impact would occur if a **two-way stop controlled** intersection, based on the worst approach delay, operates at LOS F or any traffic signal warrant is met.

An impact at a **study road segment** is defined to occur under the following conditions:

> An impact would occur if a roadway segment operating at LOS A through LOS E degrades to a lower level of service E or F. If a segment is already operating at LOS F any increase during the peak hour (one vehicle) is considered an impact.

Caltrans Impact Criteria

Caltrans perceives an impact when there is any degradation in the performance measure below the cusp of C/D. If a facility is currently operating at or below LOS D, then any trips added represent a potential impact, and the performance measure should be brought back to predevelopment conditions. While a single trip added to a degraded facility is not usually reflected in the performance measure, Caltrans reserves the ability to consider a single trip as an impact.

1.5 Funding for Transportation Improvements

TAMC Fee

The Transportation Agency for Monterey County (TAMC) and its member jurisdictions have adopted a county-wide, regional impact fee to cover the costs for studies and construction of many improvements throughout Monterey County. This impact fee, which went into effect on August 27, 2008, is applied to all new development within Monterey County. The governing document for the fee is the Regional Impact Fee Nexus Study Update (March 26, 2008) prepared by Kimley-Horn Associates, Inc. The Regional Impact Fee Nexus Study Update was updated again in 2013.

Monterey County Traffic Impact Fee

The 2010 Monterey County General Plan, which was adopted October 26, 2010, includes the following policies:

Policy C-1.8 Development proposed in cities and adjacent counties shall be carefully reviewed to assess the proposed development's impact on the County's circulation system. The County, in consultation with TAMC and Monterey County cities shall, within 18 months of adoption of the General Plan, develop a County Traffic Impact fee that addresses Tier 2 impacts of development in cities and unincorporated areas. From the time of adoption of the General Plan until the time of adoption of a County Traffic Impact Fee, the County shall impose an ad hoc fee on its applicants based upon a fair share traffic impact fee study.

Policy C-1.9 All available public and private sources shall be used for the funding of road and highway development, improvement and maintenance.

Policy C-1.10 The County, in coordination with TAMC and other affected agencies, shall continue efforts to improve traffic congestion at critical locations.

Policy C-1.11 In addition to the County Traffic Impact Fee established in Policy C-1.8, the County shall require new development to pay a Regional Traffic Impact Fee developed collaboratively between TAMC, the County, and other local and state agencies to ensure a funding mechanism for regional transportation improvements mitigating Traffic Tier 3 impacts.

To date, a county-wide traffic fee program has yet to be adopted. However, the County has been assessing fees for the Countywide Traffic Impact fee on an ad hoc basis per the fee program's draft fee schedule.

TAMC Measure X Transportation Safety and Investment Plan

Measure X was approved by the voters of Monterey County in November 2016. It is anticipated to generate an estimated $20 million annually for a total of $600 million over thirty years through a retail transactions and use tax of a three-eighths' of one-percent (3/8%). The revenue from the sales tax measure will be used to fund transportation safety and mobility projects in Monterey County. Projects will be implemented in North Monterey County along the San Miguel Canyon Road – Hall Road corridor (County Road G-12) and construction of the Highway 156/Castroville Boulevard interchange near Castroville. This sales tax measure will leverage additional state and federal funds to expand the total funding available for transportation improvements in the County.

2 EXISTING CONDITIONS

This chapter presents a description of the existing road network, existing traffic volumes, a qualitative Level of Service (LOS) analysis, and an overview of traffic flow conditions within the study area under existing traffic conditions.

2.1 Existing Road Network

The existing local roadways relevant to this project and the project study area include Pesante Road, North King Road, Cross Road, Blackie Road, Prunedale South Road, Reese Circle, Country Meadows Road, Harrison Road, and US 101. These roadways are briefly discussed below:

Pesante Road is a two-lane county road and has pavement widths that vary from about 28 feet with 0 to 8-foot shoulders to about 20 feet east of Cross Road. The westbound Pesante Road approach to US 101 is currently a stop sign controlled approach. A right-turn lane is currently provided on the northbound US 101 approach to Pesante Road and a right-turn acceleration lane is currently provided on northbound US 101 north of the Pesante Road intersection.

North King Road is a two lane north-south county road that extends north from Pesante Road for approximately eight-tenths of a mile. North King Road forms the north leg of an offset intersection with Pesante Road and King Road, which extends south of Pesante Road. For the purposes of this study, the North King Road-King Road / Pesante Road offset intersection was analyzed as a standard four-leg intersection. The northbound and southbound approaches at Pesante Road are stop-controlled.

Country Meadows Road is a two-lane collector that extends between Harrison Road and Reese Circle. The Country Meadows Road connection between Harrison Road and Reese Circle was completed by the Country Meadows Subdivision. This connection provides an alternative access route from the Pesante Road area to Salinas, without having to use US 101.

Cross Road provides an alternative access between the easterly end of Pesante Road and US 101 via Reese Circle. It is a two lane east-west county road that extends from Reese Circle to Pesante Road.

Harrison Road is a two-lane rural collector, which extends from Country Meadows Road south to Russell Road at the Salinas city limits. South of Russell Road, within the City of Salinas, Harrison Road becomes Main Street.

US 101 is a four-lane highway that extends in a north/south direction through North Monterey County. Grade separated interchanges are located at the US 101/Highway 156 junction, about one mile north of the Pesante Road intersection, and at Sala Road, about two miles south of the Pesante Road intersection. At-grade intersections along US 101 in the vicinity of the project include Pesante Road, Blackie Road and Reese Circle, which all have acceleration and/or deceleration lanes that function as quasi on-ramps and off-ramps at US 101.

Reese Circle is a two-lane rural collector, which extends from US 101 to Country Meadows Road. West of US 101, Reese Circle is Blackie Road.

Blackie Road is a two-lane east-west county road that extends from SR 183 in Castroville to US 101.

Prunedale South Road is a two-lane north-south county road that extends from SR 156 to Reese Circle.

The study intersections and road segments are shown in **Exhibit 3**.

2.2 Existing Transit Service

The primary public transit service in Monterey County is the bus service provided by Monterey-Salinas Transit (MST). All MST buses are wheelchair accessible and equipped with bike racks. MST bus route 29 between Salinas and Watsonville travels along US 101 in the vicinity of the project with the closest bus stop located on Vierra Canyon Road approximately two miles from the project site. There is a Park & Ride lot approximately three miles from the project site at Prunedale South Road and Meridian Spur. In addition to MST Route 29, the Prunedale Park & Ride lot also provides connections to MST Routes 28 (Watsonville-Salinas), 55 (Monterey-San Jose Express) and 86 (King City-San Jose/San Jose Airport).

2.3 Existing Bicycle and Pedestrian Facilities

The Transportation Agency for Monterey County (TAMC) Bicycle and Pedestrian Master Plan (2011) identifies existing and proposed bicycle facilities that provide access to major employers, shopping centers and schools. Consistent with State and Federal designations, there are three basic types of bicycle facilities. Each type is described below:

1. Bike path (Class I) - A completely separate right-of-way designed for the exclusive use of cyclists and pedestrians, with minimal crossings for motorists.
2. Bike lane (Class II) - A lane on a regular roadway, separated from the motorized vehicle right-of-way by paint striping, designated for the exclusive or semi-exclusive use of bicycles. Bike lanes allow one-way bike travel. Through travel by motor vehicles or pedestrians is prohibited, but crossing by pedestrians and motorists is permitted.
3. Bike route (Class III) - Provides shared use of the roadway with motorists, designated by signs or permanent markings.

There are currently no designated bicycle facilities provided in the vicinity of the proposed project. However, the following Monterey County Bikeways Projects in the vicinity of the proposed project have been identified in the TAMC Bicycle and Pedestrian Master Plan:

<u>Proposed Class II Bike Lanes</u>

Cross Road between Reese Circle and Pesante Road (Tier 3)
Blackie Road between US 101 and SR 183 (Tier 2)

<u>Proposed Class III Bike Routes</u>

Reese Circle-Country Meadows Road between Blackie Road and Damian Way (Tier 2)
Pesante Road between US 101 and Cross Road (Tier 2)

Tier 2 and Tier 3 bicycle projects are expected to be constructed within the next ten and twenty years, respectively.

The project site is located in a rural area with limited pedestrian facilities. A pedestrian crosswalk is provided across Pesante Road at the Prunedale Elementary School driveway, approximately one-quarter mile east of US 101.

2.4 Existing Conditions Intersection Operations

Weekday AM and PM peak hour turning movement counts were collected at the study intersections in April and June 2016, and May and August 2017. The traffic count dates for each intersection are included in **Table 1**.

Table 1: Traffic Count Dates

Intersection	Count Date
1. North King Road / Woodland Heights Place	5/31/17
2. North King Road / Pesante Road	5/31/17
3. Cross Road / Pesante Road	6/23/16
4. NB US 101 / Pesante Road	5/30/17
5. Prunedale South Road / Blackie Road	4/7/16
6. SB US 101 / Blackie Road	4/7/16
7. Reese Circle / Cross Road	6/23/16
8. Reese Circle / Prunedale South Road	6/23/16
9. Pollock Lane / Pesante Road	8/23/17
10. NB US 101 / Reese Circle	6/23/16
11. Pollock Lane / Cross Road / Cunha Lane	6/23/16

The traffic count data is included in **Appendix B**. Intersections #3, #7, #8, #10 and #11 were counted when local schools were not in session. Intersections #1, #2, #4, #5, #6, and #9 were counted when schools were in session. In order to account for traffic conditions during the school year at all study intersections, the traffic volumes were balanced up where appropriate with the counts conducted during the school year.

Existing conditions peak hour traffic volumes are presented in **Exhibit 4**. Based on the analysis, all of the study intersections operate at acceptable levels of service under Existing conditions. Intersection levels of service are summarized in **Exhibit 5**. LOS calculation worksheets are included in **Appendix C**.

The Pesante Road / North King Road intersection has been analyzed assuming stop control on the North King Road approach. However, a stop sign is currently not provided.

2.5 Existing Conditions Road Segment Operations

Weekday AM and PM peak hour traffic volumes on the study road segments were calculated based on the peak hour intersection counts at segment endpoints. It should be noted that the

2010 Monterey County General Plan reported US 101 between Highway 156 and Boronda Road (study segments #1, #2 and #3) as operating at LOS F under existing conditions. This was based on a conservatively low LOS E capacity of 64,200 vehicles per day for a "4-Lane Uninterrupted Flow Highway". In addition to using a conservatively low capacity threshold, the General Plan estimated the ADTs on the US 101 study segments for the year 2008 to be approximately 71,000 vehicles per day.

The 2008 volume estimates in the General Plan were based on then-current Association of Monterey Bay Area Governments (AMBAG) travel demand model forecasts rather than actual existing volumes as reported by Caltrans.

Historic and current average daily traffic (ADT) volumes for the US 101 study segments were obtained from the Caltrans Traffic Census Program website for the years 2001 to 2015 (http://www.dot.ca.gov/trafficops/census/). A review of the Caltrans data shows that the traffic volumes on these segments of US 101 experienced a downward trend between 2007 and 2009 and only slightly increased between 2009 and 2015. **Exhibit 6** illustrates the trends in average daily traffic (ADT) on US 101 in the project study area. The traffic volumes on the US 101 study segments are substantially lower than the estimated "Existing 2008" volumes in the General Plan. For example, US 101 carried an ADT of about 64,000 between Pesante Road and Sala Road in 2008. The ADT reported by Caltrans in 2015 was 62,900. This is a reduction of about 1.7%. US 101 carried an ADT of about 66,000 between Sala Road and Boronda Road in 2008. It had apparently declined to about 59,400 in 2015. This is a reduction of about 10%.

In addition, at the time the General Plan was prepared, the study segments on US 101 were classified as "4-Lane Uninterrupted Flow Highway" segments. Subsequent to the preparation of the General Plan, the Prunedale Improvement Project (PIP) was completed. The PIP made major safety and operational improvements to the US 101 corridor in the project study area that included the construction of two new interchanges, one overcrossing, one undercrossing, new local roads, the elimination of left-turn movements off of and on to US 101, and the addition of median barriers at various locations along the corridor.

As a result, the study segments on US 101 generally operate as a 4-lane freeway. The US 101 study segments were thus analyzed as basic freeway segments using the new peak hour count data to provide an updated and detailed analysis of the US 101 study segments for Existing Conditions.

Based on the analysis, all the study segments operate at acceptable levels of service under Existing Conditions. Road segment volumes and levels of service are summarized in **Exhibit 7**.

3 EXISTING PLUS PROJECT CONDITIONS

This chapter describes the analysis of the study road network under Existing Plus Project traffic conditions, including the analysis of project trip generation, distribution and assignment.

3.1 Project Trip Generation, Distribution and Assignment

The project is a standard 19-unit single-family subdivision. The trip generation for the proposed project was estimated based on the Institute of Transportation Engineers' Trip Generation handbook, 9th Edition, 2012. The project is estimated to generate 181 daily trips, with 14 occurring during the AM peak hour (4 in, 10 out) and 19 occurring during the PM peak hour (12 in, 7 out). The project trip generation estimate is provided in **Exhibit 8**.

Fifty percent of the project trips were assigned to the north via US 101 and 50 percent were assigned to the south via US 101 and the Country Meadows Road connection to Harrison Road. The AM and PM peak hour project trip assignments are shown in **Exhibit 9**. Existing Plus Project AM and PM peak hour volumes are shown in
Exhibit 10.

3.2 Existing Plus Project Conditions Intersection Operations

Intersection levels of service are summarized in **Exhibit 5**. The LOS calculation worksheets are included as **Appendix C**. All the study intersections are projected to operate at acceptable levels of service under Existing Plus Project traffic conditions.

3.3 Existing Plus Project Conditions Road Segment Operations

Roadway segment levels of service are summarized in **Exhibit 7**. All the study segments are projected to operate at acceptable levels of service under Existing Plus Project conditions.

3.4 Existing Plus Project Conditions Impacts

Based on the Monterey County and Caltrans criteria for project impacts, the proposed project would not have an impact on any of the study intersections or study road segments under Existing Plus Project conditions. However, it is recommended that the project install a stop sign with limit line and "Stop" pavement legend on the North King Road approach to Pesante Road. A W1-7 Two-Direction Large Arrow Sign should also be considered to be located on the far side of the intersection as approved by the Monterey County Public Works Department. This will provide better advance warning of North King Road terminating at Pesante Road as a T-intersection.

4 CUMULATIVE WITHOUT PROJECT CONDITIONS

This section describes the street network, and the operating conditions at the study intersections and road segments under Cumulative Without Project traffic conditions.

4.1 Cumulative Without Project Traffic Volumes

Cumulative Without Project traffic volumes are based on the 2030 Cumulative Conditions scenario within the 2010 Monterey County General Plan. In addition, there are currently five approved or pending projects within a five-mile radius of the proposed project, two of which are located along the Pesante Road corridor.

The locations of the pending projects are shown in **Appendix D**. AM and PM peak hour traffic volumes generated by the cumulative projects were estimated based on trip generation rates within the Institute of Transportation Engineers' Trip Generation handbook, or by the cumulative project's respective traffic studies. The trip generation estimates for the proposed cumulative projects are shown in **Exhibit 11**. Cumulative Without Project conditions AM and PM peak hour traffic volumes are included in **Exhibit 12**.

4.2 Cumulative Without Project Conditions Intersection Operations

Based on the analysis, the following intersections are projected to operate below their level of service standard under Cumulative Without Project Conditions:

#4. NB US 101 / Pesante Road – LOS E (AM) and LOS F (PM)
#6. SB US 101 / Blackie Road – LOS F (AM and PM)
#10. NB US 101 / Reese Circle – LOS D (AM) and LOS F (PM)

The remaining study intersections are projected to operate at acceptable levels of service under Cumulative Without Project traffic conditions. Intersection levels of service are summarized in **Exhibit 5**. LOS calculation worksheets are included in **Appendix C**.

4.3 Cumulative Without Project Conditions Road Segment Operations

Roadway segment levels of service are summarized in **Exhibit 7**. All of the study segments are projected to operate at acceptable levels of service under Cumulative Without Project conditions with the exception of US 101, with levels of services on specific segments as follows:

#1. NB US 101 between SR 156 and Pesante Rd – LOS E (AM), LOS F (PM)
#1. SB US 101 between SR 156 and Pesante Rd – LOS F (AM & PM)
#2. NB US 101 between Pesante Rd and Sala Rd – LOS D (AM), LOS F (PM)
#2. SB US 101 between Pesante Rd and Sala Rd – LOS E (AM), LOS F (PM)
#3. NB US 101 between Sala Rd and Boronda Rd – LOS D (AM), LOS F (PM)
#3. SB US 101 between Sala Rd and Boronda Rd – LOS F (AM & PM)

5 CUMULATIVE PLUS PROJECT CONDITIONS

This section describes the analysis and results for Cumulative conditions with the buildout of the proposed project.

5.1 Cumulative Plus Project Intersection Operations

Trips generated by the proposed project were added to the Cumulative Without Project volumes to obtain Cumulative Plus Project volumes, which are shown in **Exhibit 13**.

Based on the analysis, the following intersections are projected to operate below their level of service standard under Cumulative Plus Project Conditions:

#4. NB US 101 / Pesante Road – LOS E (AM) and LOS F (PM)
#6. SB US 101 / Blackie Road – LOS F (AM and PM)
#10. NB US 101 / Reese Circle – LOS D (AM) and LOS F (PM)

The degradation of level of service at these locations is due to the increase in through traffic on US 101. The project's impact is inconsequential in light of the overall volumes on US 101. The LaTourette Subdivision will only add 5 morning and 4 evening peak hour trips to the Pesante Road northbound on-ramp. The project will only add 4 morning and 3 evening peak hour trips to the Blackie Road southbound on-ramp. The project will not add any measurable trips to the Reese Circle northbound ramps. By comparison, US 101 will carry about 2,000 morning peak hour and 2,500 evening peak hour through trips in the northbound direction and 2,500 morning peak hour and 3,000 evening peak hour trips in the southbound direction. The total turning volumes to and from Pesante Road and Blackie Road are all about 200 vehicles per peak hour in both the morning and evening peak hours. Reese Circle will carry about 100 vehicles per peak hour in both directions in the morning and evening peak hours.

The remaining study intersections are projected to operate at acceptable levels of service under Cumulative Plus Project traffic conditions. Intersection levels of service are summarized in **Exhibit 5**. LOS calculation worksheets are included in **Appendix C**.

5.2 Cumulative Plus Project Road Segment Operations

Roadway segment levels of service are summarized in **Exhibit 7**. All of the study segments are projected to operate at acceptable levels of service under Cumulative Plus Project conditions with the following exceptions:

#1. NB US 101 between SR 156 and Pesante Rd – LOS E (AM), LOS F (PM)
#1. SB US 101 between SR 156 and Pesante Rd – LOS F (AM & PM)
#2. NB US 101 between Pesante Rd and Sala Rd – LOS D (AM), LOS F (PM)
#2. SB US 101 between Pesante Rd and Sala Rd – LOS E (AM), LOS F (PM)
#3. NB US 101 between Sala Rd and Boronda Rd – LOS D (AM), LOS F (PM)
#3. SB US 101 between Sala Rd and Boronda Rd – LOS F (AM & PM)

5.3 Cumulative Plus Project Conditions Impacts

Based on the Monterey County and Caltrans criteria for project impacts, the proposed project would have a cumulative impact on the following study intersections and road segments:

Intersections	Road Segments
#4. NB US 101 / Pesante Road	#1. US 101 – Highway 156 to Pesante Road
#6. SB US 101 / Blackie Road	#2. US 101 – Pesante Road to Sala Road
#10. NB US 101 / Reese Circle	#3. US 101 – Sala Road to Boronda Road

6 BLACKIE ROAD INTERSECTION GEOMETRIC ANALYSIS

This section references the geometric analysis of the Blackie Road / Prunedale South Road and the Blackie Road / Southbound US 101 intersections from the *Charolais Ranch Subdivision Traffic Impact Analysis* (Mott MacDonald, August 8, 2016). Blackie Road is diagonally oriented at its intersections with Prunedale South Road and US 101. This creates skewed intersections that can make it difficult for large trucks to perform turning movements. County staff requested the following geometric analysis of these intersections. The intersection alignments are shown in **Appendix E**.

6.1 Prunedale South Road / Blackie Road Geometric Analysis

Truck turning templates were prepared for the northbound right-turn and westbound left-turn movements at the Prunedale South Road / Blackie Road intersection. The truck turning templates were drawn using Google Earth aerials as the base maps.

The turning templates were used to determine the largest truck-tractor combinations that can perform these movements without encroaching into opposing lanes of traffic or onto the paved shoulders.

The turning templates were prepared using WB-40, California Legal-50 and STAA-Standard truck types. The truck turning templates for the Prunedale South Road / Blackie Road intersection are included in **Appendices F** through **H** and are described below.

WB-40 (**Appendix F**): The WB-40 truck is shown making the northbound right-turn and westbound left-turn without encroaching into opposing lanes of traffic or the paved shoulder.

California Legal-50 (**Appendix G**): The California Legal-50 truck is shown making the northbound right-turn without encroaching into opposing lanes of traffic but with a slight encroachment onto the paved shoulder. The truck is shown making the westbound left-turn without encroaching into opposing lanes of traffic or the paved shoulder.

STAA-Standard (**Appendix H**): The STAA-Standard truck is shown making the northbound right-turn without encroaching into opposing lanes of traffic but with some encroachment onto the paved shoulder. The truck is shown making the westbound left-turn without encroaching into opposing lanes of traffic but encroaching onto the paved shoulder.

6.2 Southbound US 101 / Blackie Road Geometric Analysis

Truck turning templates were prepared for the southbound right-turn movement at the US 101 / Blackie Road intersection. The truck turning templates were drawn using Google Earth aerials for the base maps.

The turning templates were used to determine the largest truck-tractor combinations that can perform these movements without encroaching into opposing lanes of traffic, guardrails, or onto the paved shoulders.

The turning templates were prepared using WB-40, California Legal-50 and STAA-Standard truck types. The truck turning templates for the US 101 / Blackie Road intersection are included in **Appendices I** through **K** and are described below.

WB-40 (**Appendix I**): The WB-40 truck is shown making the southbound right-turn with a slight encroachment onto the paved shoulder.

California Legal-50 (**Appendix J**): The California Legal-50 truck is shown making the southbound right-turn and encroaching into and beyond the opposing lane of traffic.

STAA-Standard (**Appendix K**): The STAA-Standard truck is shown making the southbound right-turn and encroaching into and beyond the opposing lane of traffic.

6.3 Summary of Blackie Road Geometric Analysis

As discussed in Section 6.1, turning templates were prepared for the Blackie Road intersections with Prunedale South Road and Southbound US 101 using WB-40, California Legal-50 and STAA-Standard truck types. This was analyzed to evaluate the adequacy of truck traffic to arrive at and depart from the project during construction. The project will only generate occasional delivery trucks when fully developed as a residential subdivision.

Prunedale South Road / Blackie Road Intersection

The results indicate that all three of the analyzed truck types can maneuver through the Prunedale South Road / Blackie Road intersection without encroaching into opposing lanes of traffic and with little to no encroachment onto the paved shoulders.

Southbound US 101 / Blackie Road Intersection

The results indicate that WB-40 trucks can maneuver through the SB US 101 / Blackie Road intersection without encroaching into opposing lanes of traffic and with only a slight encroachment onto the paved shoulder.

The results indicate that California Legal-50 and STAA-Standard trucks encroach into the opposing lane of traffic and onto the paved shoulder, and that STAA-Standard trucks also extend beyond the paved shoulder.

It should be noted that the project is a residential subdivision and would therefore not be expected to generate heavy-truck trips. The trucks associated with the construction of the project's infrastructure are anticipated to be either 3-axle dump trucks, 3-axle dump trucks with full pull trailers, or 2-axle trucks pulling doubles. None of these trucks would be longer than the WB-40 shown in **Appendix F** and **Appendix I**; therefore, project-related truck traffic will be able to maneuver through the Blackie Road intersections without encroaching into opposing lanes of traffic.

7 PROJECT ACCESS

This section of the report addresses project impacts along the access route between the project site and Pesante Road. This is proposed to be through the existing Woodland Heights neighborhood. The issues will be impacts on the quality of life in the neighborhood and conformance of the neighborhood road network to County standards for the anticipated traffic volumes.

7.1 On-Site Circulation

The primary internal access to the residential lots will be via a 22-foot wide private road that will extend to the existing Woodland Heights Place. This is consistent with Private Rural Road standards for a Monterey County Tertiary Road as described in the “Standard Details”, October 1977. A Tertiary Road can serve up to 100 dwelling units. The project is proposed to include 19 homes, so this roadway is adequate.

The project will also have a 13-foot wide emergency access road that will extend to North King Road that will also provide access to two of the residential lots. Another 13-foot wide road within the subdivision will provide access to up to four lots. County standards for a common driveway apply. These internal roadways are adequate as proposed.

7.2 Access Route from Pesante Road

Existing Conditions

Access between the Project and Pesante Road will be provided by North King Road, Woodland Heights Place and Woodland Heights Court. **Exhibit 14** tabulates each of the study roads by segment in terms of County road type as defined by the Monterey County “Standard Details”, October 1977. It also tabulates the road width, number of homes served, and AM peak, PM peak and approximate daily traffic volumes for both Existing and Existing Project conditions.

The project site is located a clear distance of about 0.85 miles north of Pesante Road. The project will use North King Road for about 0.30 miles from Pesante Road to a three-pronged fork in the road. North King Road immediately north of Pesante Road carries 31 trips during the AM peak hour and 27 trips during the PM peak hour. It serves the entire Woodland Heights subdivision with 23 homes, 1 home between the Security Gate and North King Road, 6 homes along the east and north forks of the three-pronged fork and 12 homes served by Moonlight Court for a total of 42 homes. It is estimated that the north leg of North King Road carries about 420 daily trips.

The east prong of the three-pronged fork serves a single-family home and several out-buildings. It carried one AM peak hour trip and no PM peak hour trips. The middle prong appears to serve five single family homes and carried 5 AM peak hour trips and 6 PM peak hour trips.

The west leg is Woodland Heights Place, which is the primary access route between the LaTourette Subdivision and Pesante Road. It carried 18 AM peak hour trips and 20 PM peak hour trips. It serves the existing Woodland Heights gated subdivision, which has 23 homes, as well as one residence between the security gate and the fork in the road. It carries about 230 daily trips at the security gate.

Woodland Heights Place has direct driveway access to 10 homes between the security gate and Woodland Heights Court. The traffic volume on North King Road just south of Woodland Heights Place is about 130 vehicles per day.

Woodland Heights Lane at the Woodland Heights Place intersection serves 6 homes, which is estimated to generate about 60 daily trips.

Woodland Heights Court serves 7 homes, which is estimated to generate about 70 daily trips.

The Project will use a common driveway that extends from the Woodland Court cul-de-sac bulb to the Project Boundary. It currently provides a connection to the private driveway of the single-family home at 8620 Woodland Court, which is the only home served. The width of the common driveway is 12 feet. It is allowed to serve up to 4 homes.

Currently, all segments of North King Road are designed to Private Tertiary Rural Sidehill Road standards on hilly terrain or Private Tertiary Rural Road standards on level terrain. They serve 42 homes or less and carry daily traffic volumes of 400 or less. All existing volumes are substantially less than the 100 homes with 1,000 vehicles per day allowed with Private Rural Tertiary Roads.

Existing Plus Project

The Project will add traffic from 19 homes to its access connecting with Pesante Road. **Exhibit 14** indicates that this will result in an additional approximately 190 daily trips along the private driveway next to 8620 Woodland Heights Court. This road will require widening to 22 feet to meet the Monterey County standards for a Private Tertiary Sidehill Rural Road. The daily volume of 190 to 200 vehicles per day between the Woodland Court Cul-de-Sac bulb and the Project Boundary will be well within the 1,000 vehicles per day threshold for a Private Tertiary Rural Road.

The resulting volume along Woodland Place will be a maximum of 430 vehicles per day. This is well within the existing Private Tertiary Sidehill Road allowable threshold of 1,000 vehicles per day.

North King Road will carry about 610 vehicles per day, which is also within the allowable threshold of 1,000 vehicles per day for the existing Private Tertiary Road.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Concluding Comments

This traffic impact analysis evaluated the impacts from the traffic that would be generated by the development of the LaTourette Subdivision project. Four development scenarios were assessed in the traffic analysis, namely, Existing, Existing Plus Project, Cumulative Without Project, and Cumulative Plus Project traffic conditions.

8.2 Existing Plus Project Traffic Conditions

The results have been thoroughly discussed in the preceding chapters of this report and the conclusion is that the following off-site improvements would be required to be implemented by the Project to achieve acceptable traffic operations under Existing Plus Project traffic conditions.

1. Widen the existing common driveway that extends from the Woodland Court Cul-de-Sac bulb to the Project Boundary from its existing 12-foot width to 22 feet to comply with the Monterey County Tertiary Rural Sidehill Road standard.

2. Install a stop sign with limit line and “Stop” pavement legend. A W1-7 Two-Direction Large Arrow Sign should also be considered to be located on the far side of the intersection as approved by the Monterey County Public Works Department.

8.3 Cumulative Plus Project Traffic Conditions

Under Cumulative Plus Project Conditions, the following intersections and road segments would operate at deficient levels of service. Based on the Monterey County and Caltrans criteria for project impacts, the proposed project would have a cumulative impact on these study intersections and road segments.

Intersections	Road Segments
#4. NB US 101 / Pesante Road	#1. US 101 – Highway 156 to Pesante Road
#6. SB US 101 / Blackie Road	#2. US 101 – Pesante Road to Sala Road
#10. NB US 101 / Reese Circle	#3. US 101 – Sala Road to Boronda Road

8.4 Project Mitigation Measures

The Project shall implement the following mitigations.

1. Widen the existing common driveway that extends from the Woodland Court Cul-de-Sac bulb to the Project Boundary from its existing 12-foot width to 22 feet to comply with the Monterey County Tertiary Rural Sidehill Road standard.

2. Install a stop sign with limit line and “Stop” pavement legend. A W1-7 Two-Direction Large Arrow Sign should also be considered to be located on the far side of the intersection as approved by the Monterey County Public Works Department.

3. Pay the following Traffic Impact Fees:

a. TAMC Fee

Both TAMC and Caltrans consider payment of regional development impact fees as adequate mitigation for cumulative impacts to state highways and the regional road network. Therefore, payment of the TAMC fee would mitigate the project's contribution to cumulative impacts at these locations. The TAMC fee per single family dwelling unit is $4,391.75. The total TAMC Traffic Impact Fee for the 19-home LaTourette Subdivision project would be $83,443.

b. Countywide Traffic Impact Fee

Monterey County assesses fees for the Countywide Traffic Impact Fee on an ad hoc basis per the impact fee program's draft fee schedule. The draft fee per single family dwelling unit is $3,121. The total Monterey Countywide Traffic Impact Fee for the 19-home LaTourette Subdivision project would be $59,299.

c. Pesante Road Corridor Fee

In addition, the County is collecting fees from new development along the Pesante Road corridor for the Country Meadows Road extension. This extension has been completed and provides an alternative to US 101 to access Salinas. The County determined that a fee of $1,000 per lot would be assessed for each of the developments along Pesante Road to reimburse the Country Meadows subdivision for the construction of this extension. The fee for the Country Meadows extension would be $19,000.

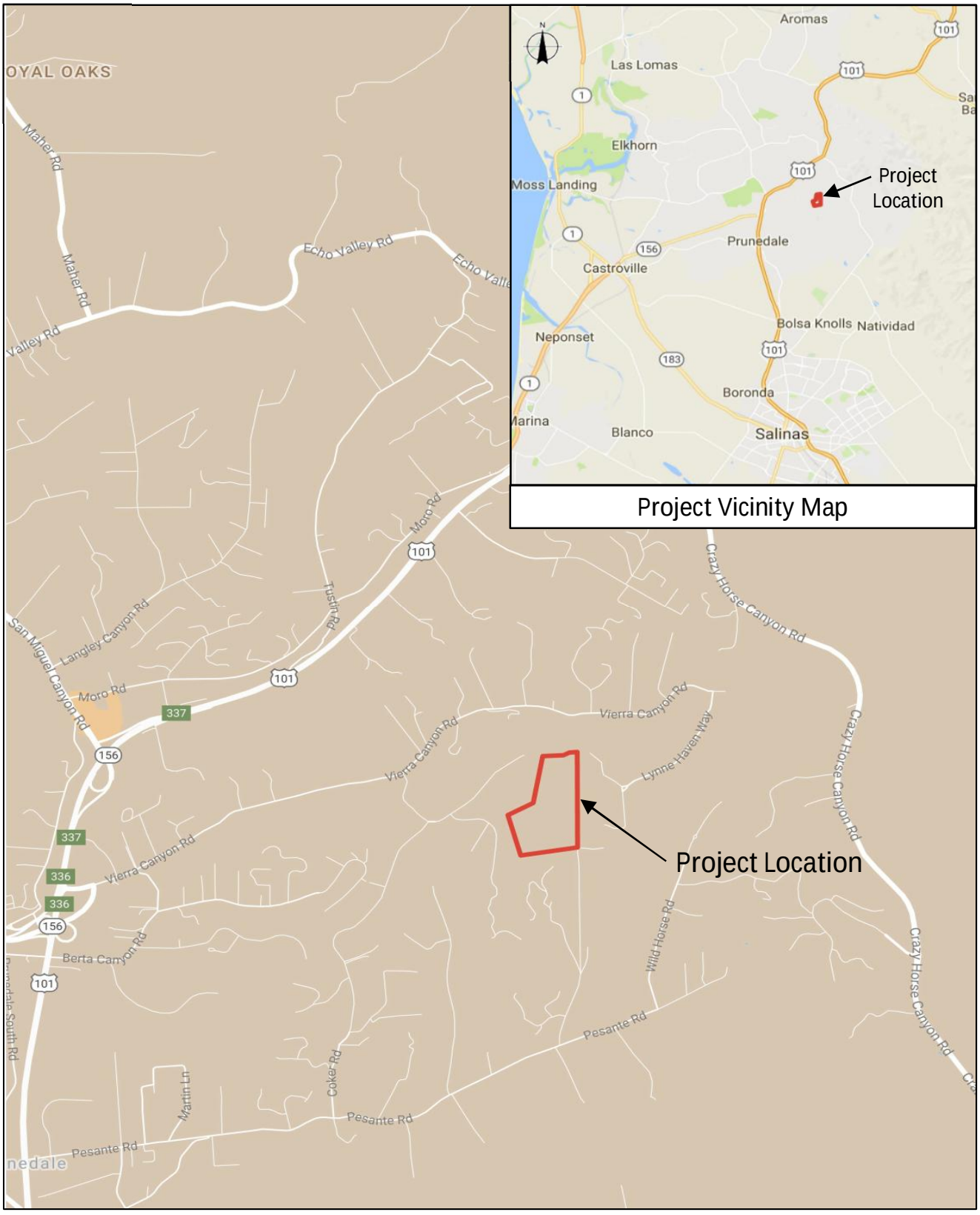


Exhibit 1

Project Location Map

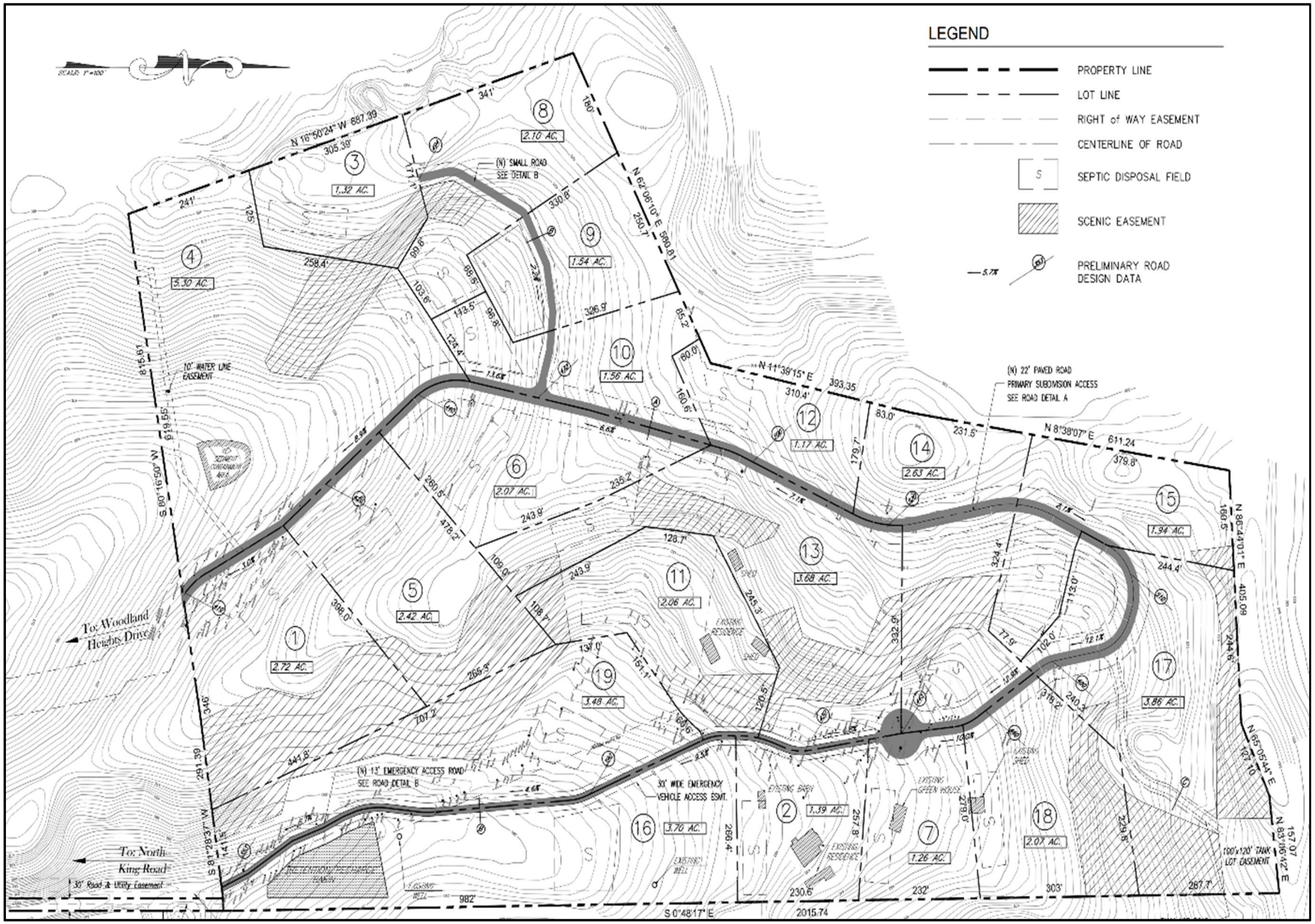
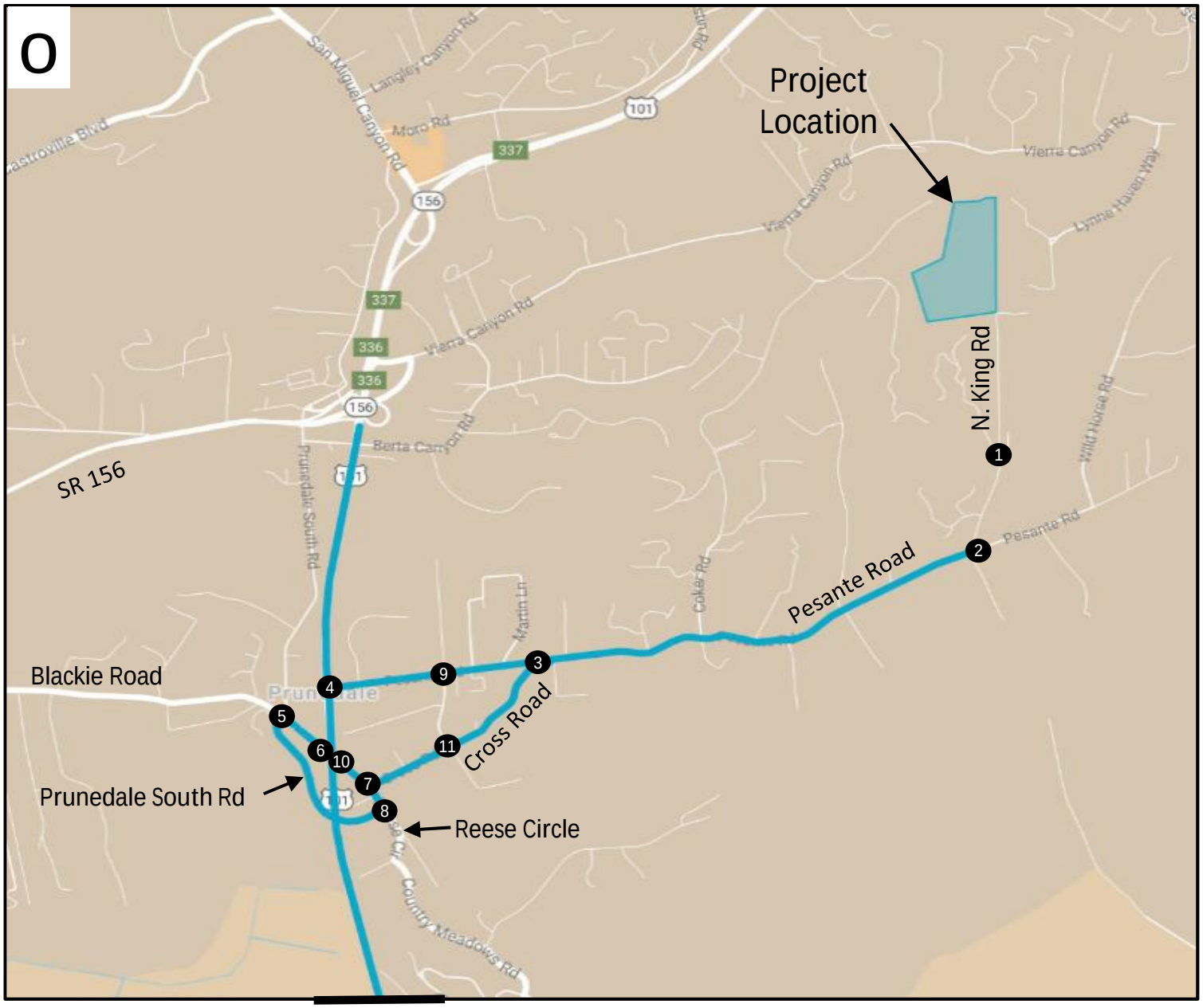
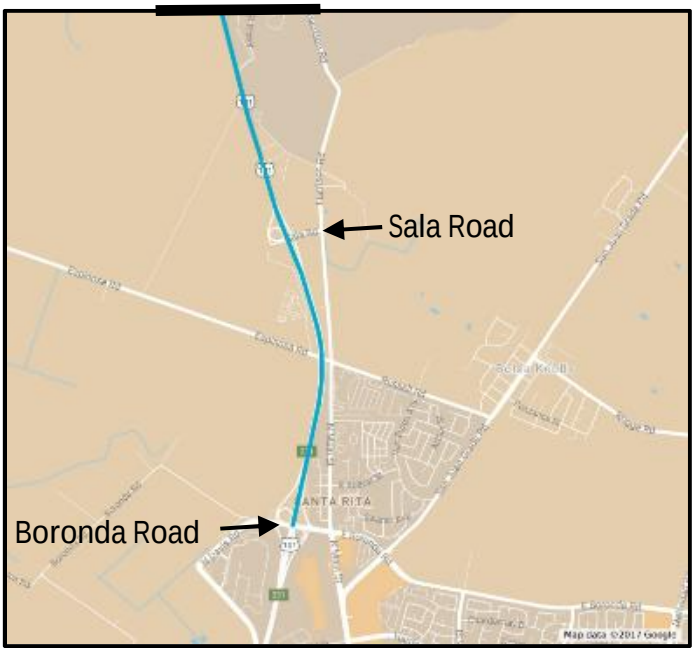


Exhibit 2

Project Site Plan



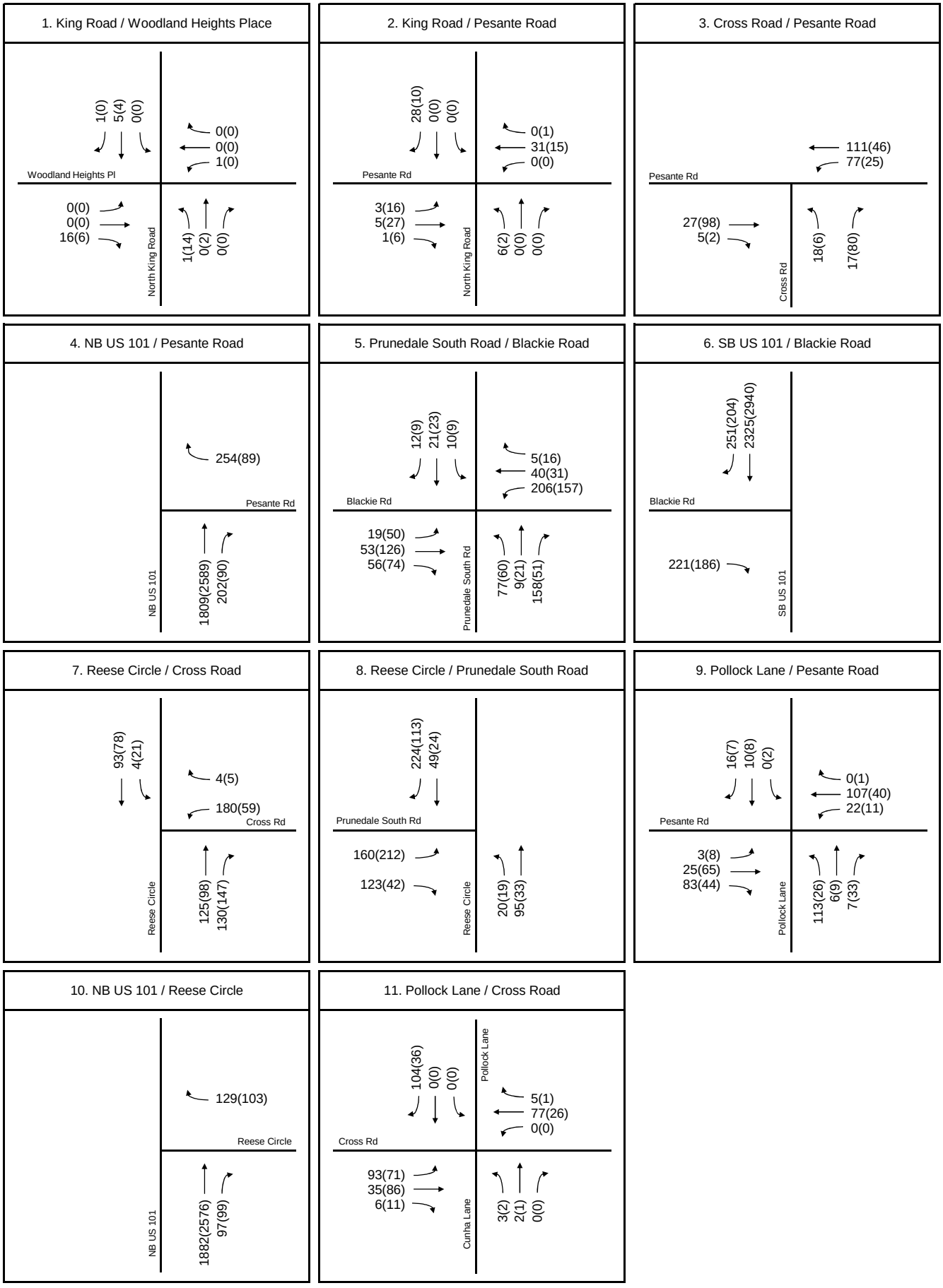


Legend

X Study Intersection

Study Segment

Exhibit 3
Project Study Area



XX (YY) = AM (PM)

Count Dates:

Intersections 1 & 2: 5/31/17

Intersection 4: 5/30/17

Intersections 3, 7, 8, 10, & 11: 6/23/16

Intersections 5 & 6: 4/7/16

Intersection 9: 8/23/17

Exhibit 4

Existing Conditions

AM & PM Peak Hour Volumes

	N-S Street	E-W Street	Existing Intersection Control	LOS Standard	Peak Hour	Existing Conditions		Existing Plus Project Conditions		Cumulative Without Project Conditions		Cumulative Plus Project Conditions	
						Density[3] or Delay[4,5]	LOS	Density[3] or Delay[4,5]	LOS	Density[3] or Delay[4,5]	LOS	Density[3] or Delay[4,5]	LOS
1	King Road	Woodland Heights Place	Uncontrolled	D	AM	8.7	A	8.8	A	8.7	A	8.9	A
					PM	8.5	A	8.5	A	8.5	A	8.5	A
2	King Road	Pesante Road	Two-Way Stop	D	AM	9.1	A	9.3	A	9.3	A	9.5	A
					PM	9.2	A	9.4	A	9.4	A	9.7	A
3	Cross Road	Pesante Road	One-Way Stop	D	AM	10.2	B	10.2	B	10.5	B	10.5	B
					PM	9.3	A	9.4	A	9.5	A	9.6	A
4	NB US 101	Pesante Road	Merge-Diverge	C/D	AM	22.6	C	22.6	C	36.5	E	36.6	E
					PM	25.8	C	25.9	C	41.6	F	41.6	F
5	Prundale South Road	Blackie Road	Signal	D	AM	17.0	B	17.1	B	17.8	B	17.9	B
					PM	14.6	B	14.7	B	15.0	B	15.1	B
6	SB US 101	Blackie Road	Merge-Diverge	C/D	AM	25.6	C	25.6	C	42.1	F	42.1	F
					PM	27.0	C	27.0	C	40.5	F	40.5	F
7	Reese Circle	Cross Road	One-Way Stop	D	AM	12.1	B	12.2	B	13.3	B	13.4	B
					PM	11.3	B	11.3	B	11.6	B	11.7	B
8	Reese Circle	Prundale South Road	One-Way Stop	D	AM	9.5	A	9.5	A	9.7	A	9.7	A
					PM	9.6	A	9.7	A	9.9	A	9.9	A
9	Pollock Lane	Pesante Road	Two-Way Stop	D	AM	13.3	B	13.4	B	14.8	B	14.9	B
					PM	10.1	B	10.1	B	10.5	B	10.6	B
10	NB US 101	Reese Circle	Merge-Diverge	C/D	AM	17.9	B	17.9	C	30.5	D	30.5	D
					PM	23.4	C	23.5	C	39.6	F	39.7	F
11	Pollock Lane	Cross Road	Two-Way Stop	D	AM	12.2	B	12.3	B	13.4	B	13.5	B
					PM	10.9	B	11.1	B	11.6	B	11.6	B

Notes:

1. L, T, R = Left, Through, Right
2. NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound
3. For merge-diverge analysis, density is in passenger cars per mile per lane (pc/mi/ln).
4. For signalized intersection analysis, delay is average overall delay in seconds per vehicle (sec/veh).
5. For one- and two-way stop analysis, delay (sec/veh) shown is for worst approach.
6. Analysis performed using 2010 Highway Capacity Manual methodologies.
7. LOS highlighted in red indicates intersection or merge/diverge area operating below level of service standard.

Exhibit 5

Intersection Levels of Service

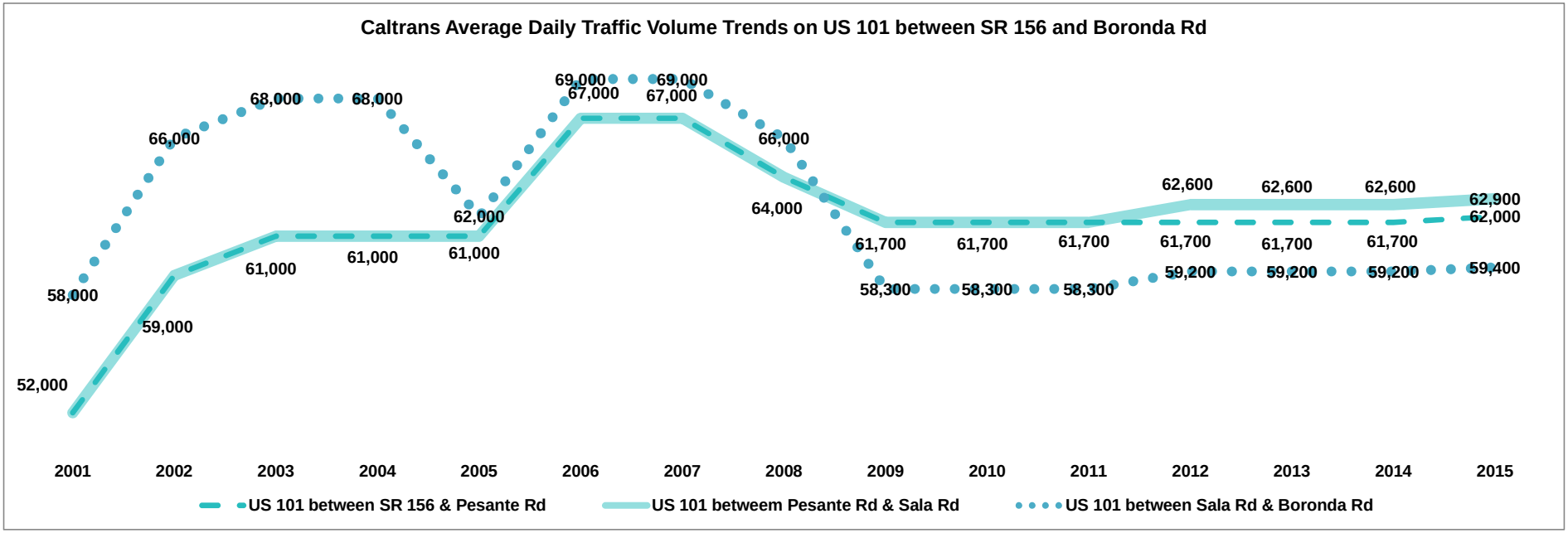


Exhibit 6

Caltrans ADT Trends 2001 - 2015

US 101 between SR 156 and Boronda Road

	Roadway Segment From / To		Roadway Type	Direction	LOS Standard	Existing Conditions						Existing Plus Project Conditions						Cumulative Without Project Conditions						Cumulative Plus Project Conditions					
						AM Peak			PM Peak			AM Peak			PM Peak			AM Peak			PM Peak			AM Peak			PM Peak		
						Volume	Density	LOS	Volume	Density	LOS	Volume	Density	LOS	Volume	Density	LOS	Volume	Density	LOS	Volume	Density	LOS	Volume	Density	LOS	Volume	Density	LOS
1	US 101	Highway 156 / Pesante Rd	4-Lane Freeway	NB	C/D	2,063	18.9	C	2,678	23.5	C	2,068	19.0	C	2,682	23.5	C	3,569	36.9	E	4,576	58.3	F	3,574	37.0	E	4,580	58.4	F
				SB		2,575	23.4	C	3,114	25.6	C	2,577	23.5	C	3,120	25.7	C	4,254	52.8	F	4,751	52.6	F	4,256	52.9	F	4,757	52.9	F
2	US 101	Pesante Rd / Sala Rd	4-Lane Freeway	NB	C/D	2,011	16.9	B	2,691	20.9	C	2,013	17.0	B	2,697	21.0	C	3,494	33.6	D	4,597	48.5	F	3,496	33.6	D	4,602	48.7	F
				SB		2,576	20.2	C	3,144	24.6	C	2,578	20.2	C	3,150	24.6	C	4,255	41.7	E	4,781	50.8	F	4,257	41.7	E	4,787	50.9	F
3	US 101	Sala Rd / Boronda Rd	4-Lane Freeway	NB	C/D	1,913	15.1	B	2,737	20.3	C	1,915	15.1	B	2,743	20.4	C	3,390	31.3	D	4,654	50.4	F	3,392	31.3	D	4,659	50.5	F
				SB		2,603	20.5	C	2,981	23.6	C	2,607	20.6	C	2,984	23.7	C	4,286	47.2	F	4,595	53.1	F	4,290	47.3	F	4,598	53.2	F

	Roadway Segment From / To		Roadway Type	Direction	LOS Standard	Existing Conditions						Existing Plus Project Conditions						Cumulative Without Project Conditions						Cumulative Plus Project Conditions					
						AM Peak			PM Peak			AM Peak			PM Peak			AM Peak			PM Peak			AM Peak			PM Peak		
						Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS
4	Blackie Rd	Prunedale South Rd / US 101	2-Lane Other Road (Undivided)	Two-Way	D	472	0.492	D	390	0.406	D	478	0.498	D	399	0.416	D	491	0.511	D	421	0.439	D	501	0.522	D	433	0.451	D
5	Prunedale S. Rd	Blackie Rd / Reese Circle	2-Lane Other Road (Undivided)	Two-Way	D	527	0.549	D	386	0.402	D	533	0.555	D	395	0.411	D	565	0.589	D	419	0.436	D	575	0.599	D	431	0.449	D
6	Reese Circle	Prunedale S. Rd / Cross Rd	2-Lane Other Road (Undivided)	Two-Way	D	528	0.550	D	382	0.398	D	535	0.557	D	392	0.408	D	572	0.596	D	476	0.496	D	583	0.607	D	470	0.490	D
7	Cross Rd	Reese Circle / Pollock Lane	2-Lane Other Road (Undivided)	Two-Way	D	318	0.331	C	232	0.242	C	325	0.339	C	242	0.252	C	340	0.354	C	309	0.322	C	351	0.366	D	323	0.336	C
8	Cross Rd	Pollock Lane / Pesante Rd	2-Lane Other Road (Undivided)	Two-Way	D	117	0.122	C	113	0.118	C	124	0.129	C	123	0.128	C	205	0.214	C	110	0.115	C	215	0.224	C	124	0.129	C
9	Pesante Rd	US 101 / Cross Rd	2-Lane Other Road (Undivided)	Two-Way	D	456	0.475	D	190	0.198	C	463	0.482	D	199	0.207	C	348	0.363	D	199	0.207	C	357	0.372	D	211	0.220	C
10	Pesante Rd	Cross Rd / North King Rd	2-Lane Other Road (Undivided)	Two-Way	D	232	0.242	C	249	0.259	C	246	0.256	C	268	0.279	C	503	0.524	D	295	0.307	C	523	0.545	D	321	0.334	C
11	North King Rd	North of Pesante Rd	2-Lane Other Road (Undivided)	Two-Way	D	31	0.032	C	27	0.028	C	45	0.047	C	46	0.048	C	458	0.477	D	252	0.263	C	458	0.477	D	252	0.263	C
12	Reese Circle	US 101 / Cross Rd	2-Lane Other Road (Undivided)	Two-Way	D	226	0.235	C	202	0.210	C	226	0.235	C	202	0.210	C	503	0.524	D	295	0.307	C	523	0.545	D	321	0.334	C

Notes:

1. Density is in passenger cars per mile per lane (pc/mi/ln).
2. V/C = Volume to Capacity Ratio
3. LOS = Level of Service
4. LOS highlighted in red indicates segment operating below level of service standard.
5. V/C for segments 3 through 10 calculated based on an LOS E capacity of 960 vehicles per hour for two-way traffic, assuming 10% of the 9,600 ADT LOS E capacity reported in the General Plan EIR.

Exhibit 7

Road Segment Levels of Service

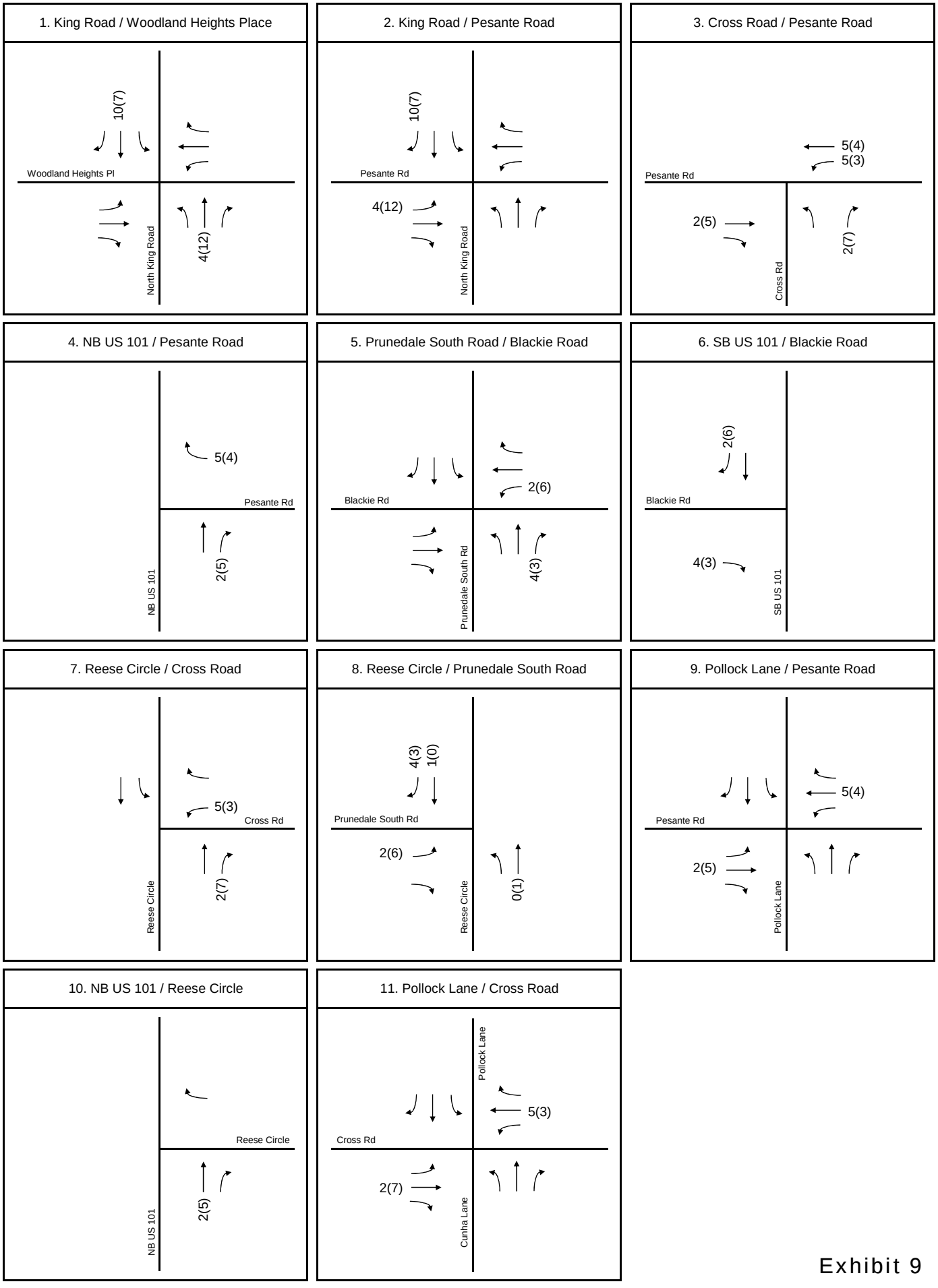
TRIP GENERATION RATES (per DU)[1]	LAND USE CODE	DAILY TRIP RATE	AM PEAK HOUR PEAK HOUR RATE	AM PEAK HOUR % OF ADT	AM PEAK HOUR % IN	AM PEAK HOUR % OUT	PM PEAK HOUR PEAK HOUR RATE	PM PEAK HOUR % OF ADT	PM PEAK HOUR % IN	PM PEAK HOUR % OUT
Single-Family Detached Housing	210	9.52	0.75	8%	25%	75%	1.00	11%	63%	37%
PROPOSED USE										
	PROJECT SIZE	DAILY TRIPS	PEAK HOUR TRIPS	% OF ADT	TRIPS IN	TRIPS OUT	PEAK HOUR TRIPS	% OF ADT	TRIPS IN	TRIPS OUT
LaTourette Subdivision	19	181	14	8%	4	10	19	11%	12	7

Notes:

1. Trip generation rates published by Institute of Transportation Engineers (ITE) "Trip Generation Manual," 9th Edition, 2012.

Exhibit 8

Project Trip Generation

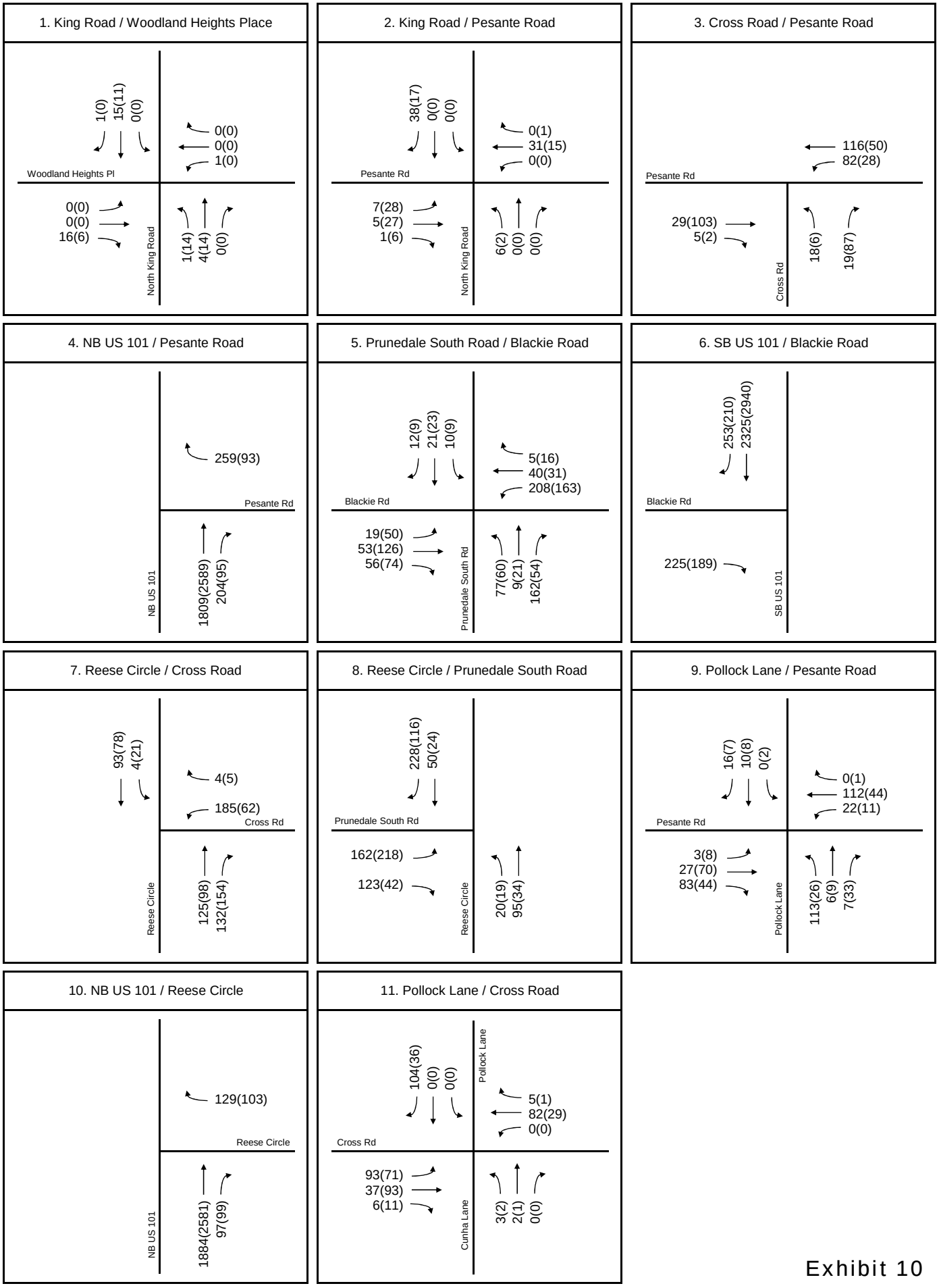


XX (YY) = AM (PM)

Exhibit 9

Project Trip Assignment

AM & PM Peak Hour Volumes



XX (YY) = AM (PM)

Exhibit 10

Existing + Project Conditions

AM & PM Peak Hour Volumes

TRIP GENERATION RATES (per DU)[1]	LAND USE CODE	DAILY TRIP RATE	AM PEAK HOUR PEAK HOUR RATE	AM PEAK HOUR % OF ADT	AM PEAK HOUR % IN	AM PEAK HOUR % OUT	PM PEAK HOUR PEAK HOUR RATE	PM PEAK HOUR % OF ADT	PM PEAK HOUR % IN	PM PEAK HOUR % OUT
Single-Family Detached Housing	210	9.52	0.75	8%	25%	75%	1.00	11%	63%	37%

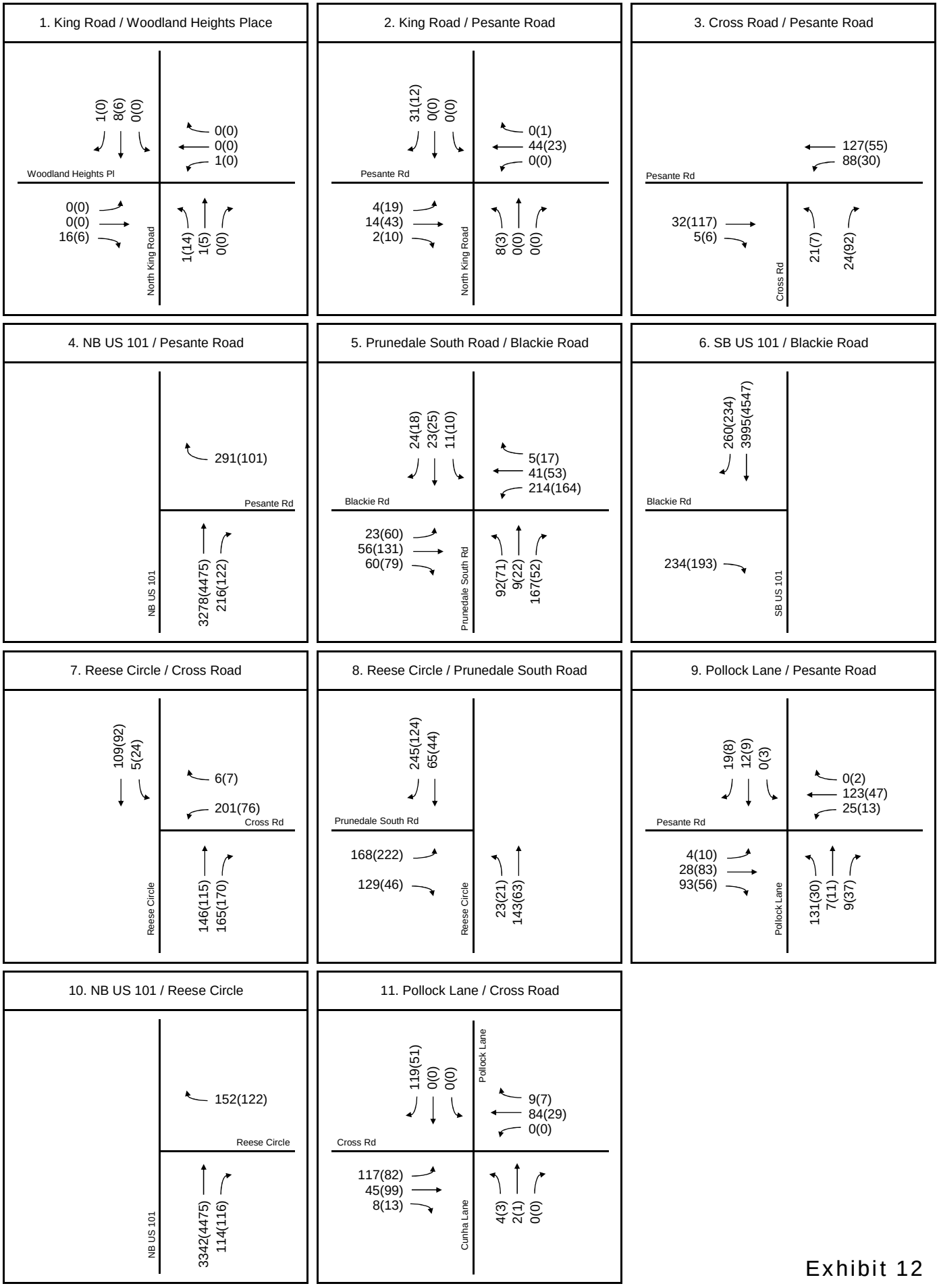
PROPOSED USE	PROJECT SIZE	DAILY TRIPS	AM PEAK HOUR TRIPS	AM % OF ADT	AM TRIPS IN	AM TRIPS OUT	PM PEAK HOUR TRIPS	PM % OF ADT	PM TRIPS IN	PM TRIPS OUT
1. Charolais Ranch Subdivision	26	248	20	8%	5	15	26	11%	16	10
2. Whitehead Subdivision	6	57	5	9%	1	4	6	11%	4	2
3. Bradshaw Subdivision	10	95	8	8%	2	6	10	11%	6	4
4. Cathrein Estates	28	267	21	8%	5	16	28	11%	18	10
5. Butterfly Village[2]	--	13,334	866	6%	265	609	1,389	10%	811	578
Total Cumulative Projects		14,000	920	7%	278	650	1,459	10%	855	604

Notes:

1. Trip generation rates published by Institute of Transportation Engineers (ITE) "Trip Generation Manual", 9th Edition, 2012, unless otherwise noted.
2. *Rancho San Juan Revised Specific Plan Addendum* , Kimley-Horn, October 2005.

Exhibit 11

Cumulative Projects Trip Generation

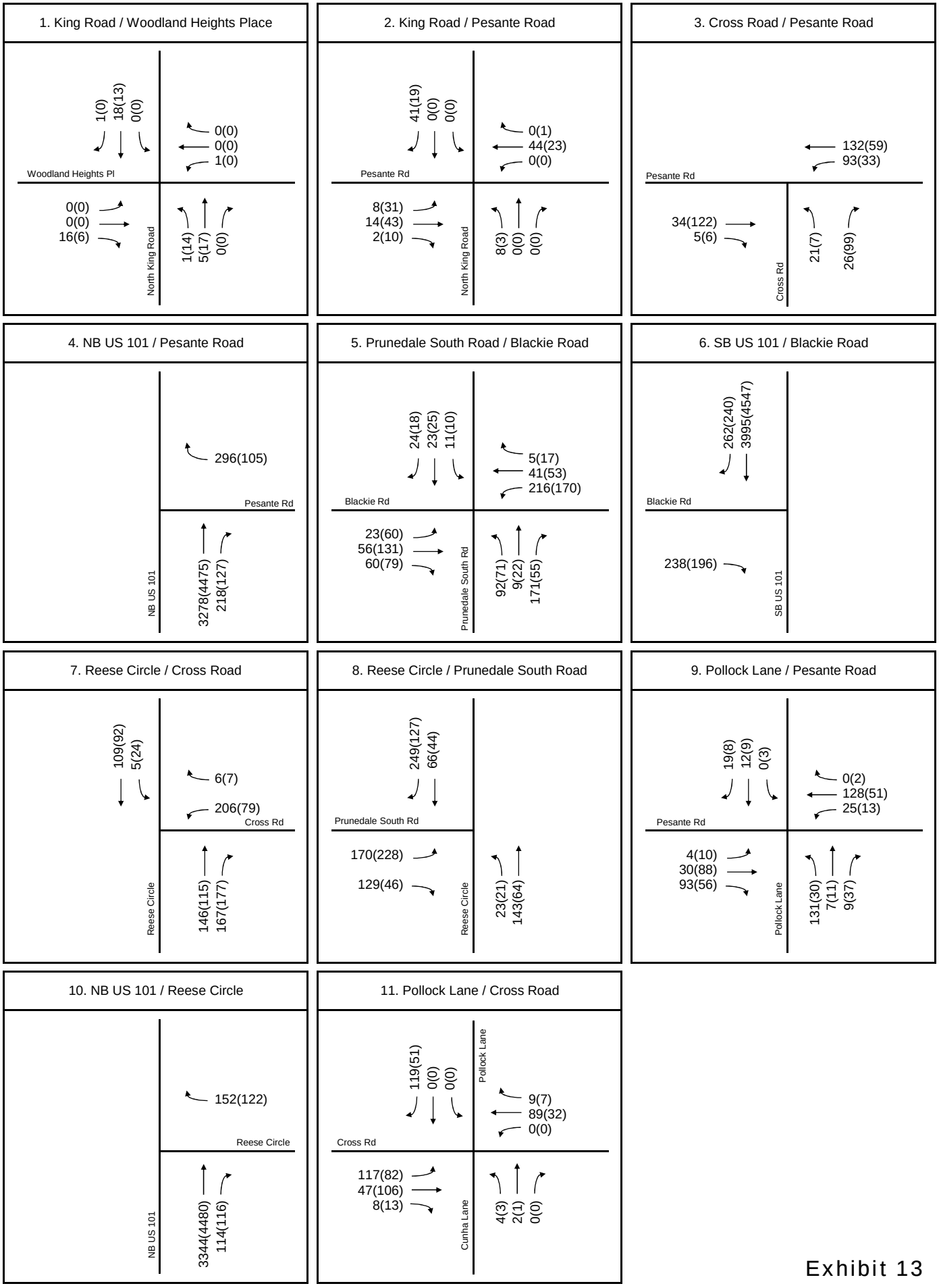


XX (YY) = AM (PM)

Exhibit 12

Cumulative Without Project Conditions

AM & PM Peak Hour Volumes



XX (YY) = AM (PM)

Exhibit 13

Cumulative Plus Project Conditions

AM & PM Peak Hour Volumes

Road	County Road Type	Allowable Maximum Number of Homes	Allowable Maximum Daily Traffic	Required Width	Provided Width	Existing		Existing Plus Project		Comment
						No. of Homes Served	ADT	No. of Homes Served	ADT	
A. North King Road										
1. Pesante Rd. to Moonlight Ct.	Private Tertiary Rural Road	100	1,000	20 ft.	20 ft.	42	420	61	610	Acceptable with Project
2. Moonglow Rd. to Woodland Heights Place	Private Tertiary Rural Road	100	1,000	20 ft.	20 ft.	30	290	49	490	Acceptable with Project
B. Woodland Heights Place										
1. North King Road to Security Gate	Private Tertiary Rural Sidehill Road	100	1,000	22 ft.	22 ft.	24	240	43	430	Acceptable with Project
2. North of Security Gate	Private Tertiary Rural Sidehill Road	100	1,000	22 ft.	22 ft.	23	230	42	420	Acceptable with Project
3. South of Woodland Heights Court	Private Tertiary Rural Sidehill Road	100	1,000	22 ft.	22 ft.	13	130	32	320	Acceptable with Project
C. Woodland Heights Lane										
1. West of Woodland Heights Place	Private Tertiary Rural Sidehill Road	100	1,000	22 ft.	22 ft.	6	60	6	60	Acceptable with Project
D. Woodland Heights Court										
1. Woodland Height Pl. to End of Cul-de-Sac	Private Tertiary Rural Sidehill Road	100	1,000	22 ft.	22 ft.	7	70	26	260	Acceptable with Project
2. End of Cul-de-Sac to 8620 Woodland Heights Ct.	Private Common Driveway	4	40	12 ft.	12 ft.	1	10	20	200	Requires Widening to 22 ft. Private Tertiary
3. 8620 Woodland Heights to Project Boundary	Private Common Driveway					0	0	19	190	Requires Widening to 22 ft. Private Tertiary

Notes:
1. ADT is estimated based on number of homes served, assuming a daily trip generation rate of 10 trips per day per home.
2. County Road Type is referenced from "Standard Details," Monterey County, October 1977.

Exhibit 14
Project Access Road Analysis

Appendices A-1 to A-4

Level of Service Descriptions

APPENDIX A-1

LEVEL OF SERVICE (LOS) DESCRIPTION
MERGE/DIVERGE SEGMENTS

Merge/diverge segment LOS is defined in terms of density for all cases of stable operation (LOS A–E). LOS F exists when the freeway demand exceeds the capacity of the upstream (diverges) or downstream (merges) freeway segment, or where the off-ramp demand exceeds the off-ramp capacity.

At LOS A, unrestricted operations exist, and the density is low enough to permit smooth merging or diverging with very little turbulence in the traffic stream. At LOS B, merging and diverging maneuvers become noticeable to through drivers, and minimal turbulence occurs. At LOS C, speed within the ramp influence area begins to decline as turbulence levels become much more noticeable. Both ramp and freeway vehicles begin to adjust their speeds to accomplish smooth transitions. At LOS D, turbulence levels in the influence area become intrusive, and virtually all vehicles slow to accommodate merging or diverging maneuvers. Some ramp queues may form at heavily used on-ramps, but freeway operation remains stable. LOS E represents operating conditions approaching or at capacity. Small changes in demand or disruptions within the traffic stream can cause both ramp and freeway queues to form.

LOS F defines operating conditions within queues that form on both the ramp and the freeway mainline when capacity is exceeded by demand. For on-ramps, LOS F exists when the total demand flow rate from the upstream freeway segment and the on-ramp exceeds the capacity of the downstream freeway segment. For off-ramps, LOS F exists when the total demand flow rate on the approaching upstream freeway segment exceeds the capacity of the upstream freeway segment. LOS F also occurs when the off-ramp demand exceeds the capacity of the off-ramp.

Exhibit 13-2 summarizes the LOS criteria for freeway merge and diverge segments. These criteria apply to all ramp–freeway junctions and may also be applied to major merges and diverges; high-speed, uncontrolled merge or diverge ramps on multilane highway sections; and merges and diverges on freeway C-D roadways. LOS is not defined for ramp roadways, while the LOS of a ramp–street junction is defined in Chapter 22, Interchange Ramp Terminals.

LEVEL OF SERVICE (LOS) CRITERIA FOR MERGE AND DIVERGE SEGMENTS
(Reference Highway Capacity Manual 2010)

LOS	Density (pc/mi/ln)	Comments
A	≤10	Unrestricted operations
B	>10–20	Merging and diverging maneuvers noticeable to drivers
C	>20–28	Influence area speeds begin to decline
D	>28–35	Influence area turbulence becomes intrusive
E	>35	Turbulence felt by virtually all drivers
F	Demand exceeds capacity	Ramp and freeway queues form

APPENDIX A-2

LEVEL OF SERVICE (LOS) DESCRIPTION
SIGNALIZED INTERSECTIONS

The capacity of an urban street is related primarily to the signal timing and the geometric characteristics of the facility as well as to the composition of traffic on the facility. Geometrics are a fixed characteristic of a facility. Thus, while traffic composition may vary somewhat over time, the capacity of a facility is generally a stable value that can be significantly improved only by initiating geometric improvements. A traffic signal essentially allocates time among conflicting traffic movements that seek to use the same space. The way in which time is allocated significantly affects the operation and the capacity of the intersection and its approaches.

The methodology for signalized intersection is designed to consider individual intersection approaches and individual lane groups within approaches. A lane group consists of one or more lanes on an intersection approach. The outputs from application of the method described in the HCM 2000 are reported on the basis of each lane. For a given lane group at a signalized intersection, three indications are displayed: green, yellow and red. The red indication may include a short period during which all indications are red, referred to as an all-red interval and the yellow indication forms the change and clearance interval between two green phases.

The methodology for analyzing the capacity and level of service must consider a wide variety of prevailing conditions, including the amount and distribution of traffic movements, traffic composition, geometric characteristics, and details of intersection signalization. The methodology addresses the capacity, LOS, and other performance measures for lane groups and the intersection approaches and the LOS for the intersection as a whole.

Capacity is evaluated in terms of the ratio of demand flow rate to capacity (v/c ratio), whereas LOS is evaluated on the basis of control delay per vehicle (in seconds per vehicle). The methodology does not take into account the potential impact of downstream congestion on intersection operation, nor does the methodology detect and adjust for the impacts of turn-pocket overflows on through traffic and intersection operation.

LEVEL OF SERVICE (LOS) CRITERIA FOR SIGNALIZED INTERSECTIONS

(Reference Highway Capacity Manual 2010)

Level of Service	Control Delay (seconds / vehicle)
A	**<10**
B	**>10 - 20**
C	**>20 - 35**
D	**>35 - 55**
E	**>55 - 80**
F	**>80**

APPENDIX A-3

LEVEL OF SERVICE (LOS) DESCRIPTION
UNSIGNALIZED INTERSECTIONS WITH TWO-WAY STOP CONTROL (TWSC)

TWSC intersections are widely used and stop signs are used to control vehicle movements at such intersections. At TWSC intersections, the stop-controlled approaches are referred to as the minor street approaches; they can be either public streets or private driveways. The intersection approaches that are not controlled by stop signs are referred to as the major street approaches. A three-leg intersection is considered to be a standard type of TWSC intersection if the single minor street approach (i.e. the stem of the T configuration) is controlled by a stop sign. Three-leg intersections where two of the three approaches are controlled by stop signs are a special form of unsignalized intersection control.

At TWSC intersections, drivers on the controlled approaches are required to select gaps in the major street flow through which to execute crossing or turning maneuvers on the basis of judgement. In the presence of a queue, each driver on the controlled approach must use some time to move into the front-of-queue position and prepare to evaluate gaps in the major street flow. Capacity analysis at TWSC intersections depends on a clear description and understanding of the interaction of drivers on the minor or stop-controlled approach with drivers on the major street. Both gap acceptance and empirical models have been developed to describe this interaction.

Thus, the capacity of the controlled legs is based on three factors:
- the distribution of gaps in the major street traffic stream,;
- driver judgement in selecting gaps through which to execute the desired maneuvers; and
- the follow-up time required by each driver in a queue.

The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, 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, in the absence of incident, control, traffic or geometric delay. Average control delay for any particular minor movement is a function of the capacity of the approach and the degree of saturation and referred to as level of service.

LEVEL OF SERVICE (LOS) CRITERIA FOR TWSC INTERSECTIONS
(Reference Highway Capacity Manual 2010)

Level of Service	Control Delay (seconds / vehicle)
A	**0 - 10**
B	**>10 - 15**
C	**>15 - 25**
D	**>25 - 35**
E	**>35 - 50**
F	**>50**

APPENDIX A-4

LEVEL OF SERVICE (LOS) DESCRIPTION
FREEWAY SEGMENTS

LOS F operations within a queue are the result of a breakdown or bottleneck at a downstream point. In practical terms, the point of the breakdown has a v/c ratio greater than 1.00, and is also labeled LOS F, although actual operations at the breakdown point and immediately downstream may actually reflect LOS E conditions. Whenever queues due to a breakdown exist, they have the potential to extend upstream for considerable distances.

The effects of a breakdown may extend upstream for a considerable distance.

LOS Criteria

A basic freeway segment can be characterized by three performance measures: density in passenger cars per mile per lane (pc/mi/ln), space mean speed in miles per hour (mi/h), and the ratio of demand flow rate to capacity (v/c). Each of these measures is an indication of how well traffic is being accommodated by the basic freeway segment.

Because speed is constant through a broad range of flows and the v/c ratio is not directly discernible to road users (except at capacity), the service measure for basic freeway segments is density. Exhibit 11-5 shows the criteria.

Exhibit 11-5
LOS Criteria for Basic Freeway Segments

LOS	Density (pc/mi/ln)
A	≤11
B	>11–18
C	>18–26
D	>26–35
E	>35–45
F	Demand exceeds capacity >45

For all LOS, the density boundaries on basic freeway segments are the same as those for surface multilane highways, except at the LOS E–F boundary. Traffic characteristics are such that the maximum flow rates at any given LOS are lower on multilane highways than on similar basic freeway segments.

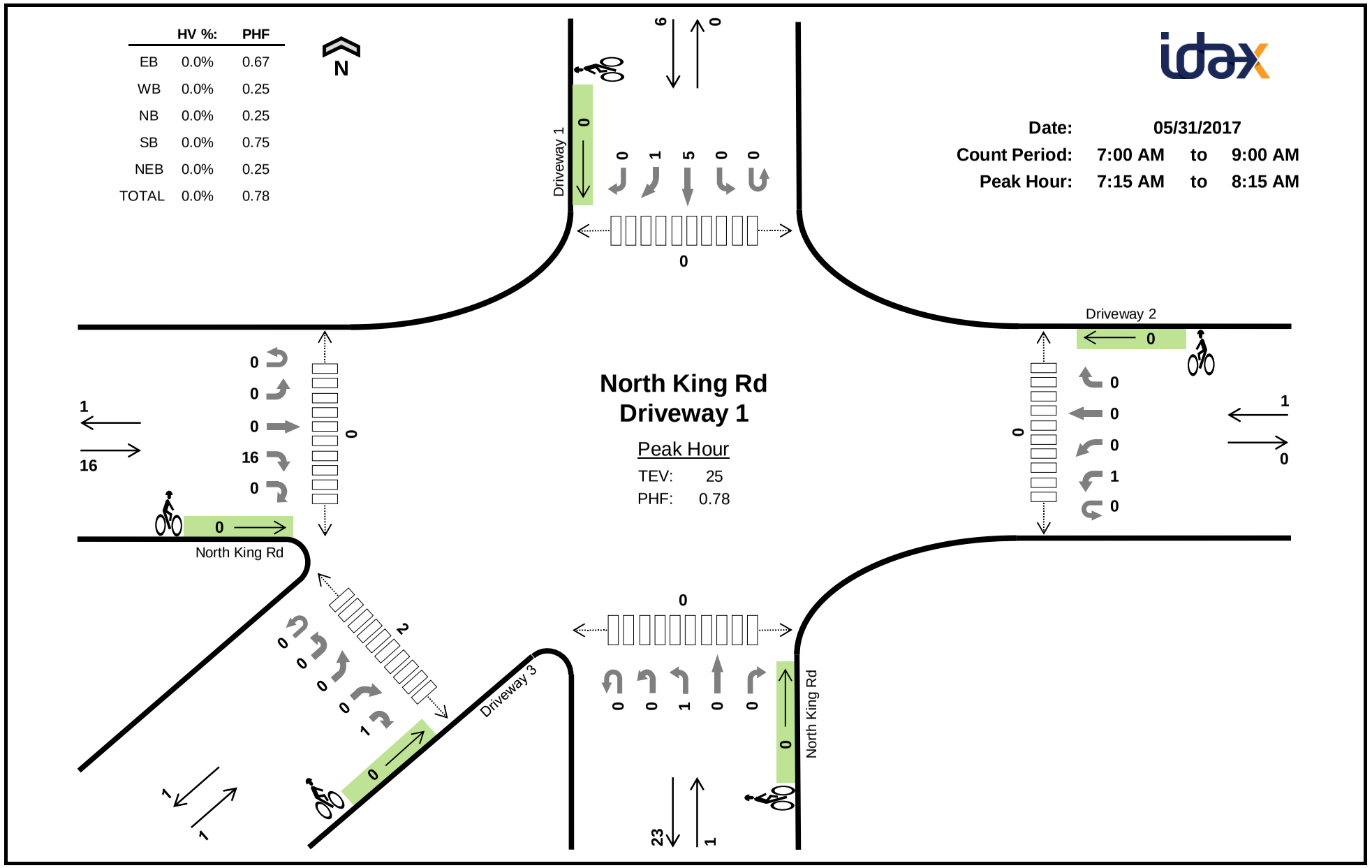
The specification of maximum densities for LOS A to D is based on the collective professional judgment of the members of the Transportation Research Board's Highway Capacity and Quality of Service Committee. The upper value shown for LOS F (45 pc/mi/ln) is the maximum density at which sustained flows at capacity are expected to occur. In effect, as indicated in the speed–flow curves of Exhibit 11-2, when a density of 45 pc/mi/ln is reached, flow is at capacity, and the v/c ratio is 1.00.

In the application of this chapter's methodology, however, LOS F is identified when demand exceeds capacity because the analytic methodology *does not allow* the determination of density when demand exceeds capacity. Although the density will be greater than 45 pc/h/ln, the methodology of Chapter 10, Freeway Facilities, must be applied to determine a more precise density for such cases.

Exhibit 11-6 illustrates the defined LOS on the base speed–flow curves. On a speed–flow plot, density is a line of constant slope beginning at the origin. The LOS boundaries were defined to produce reasonable ranges within each LOS on these speed–flow relationships.

Appendix B

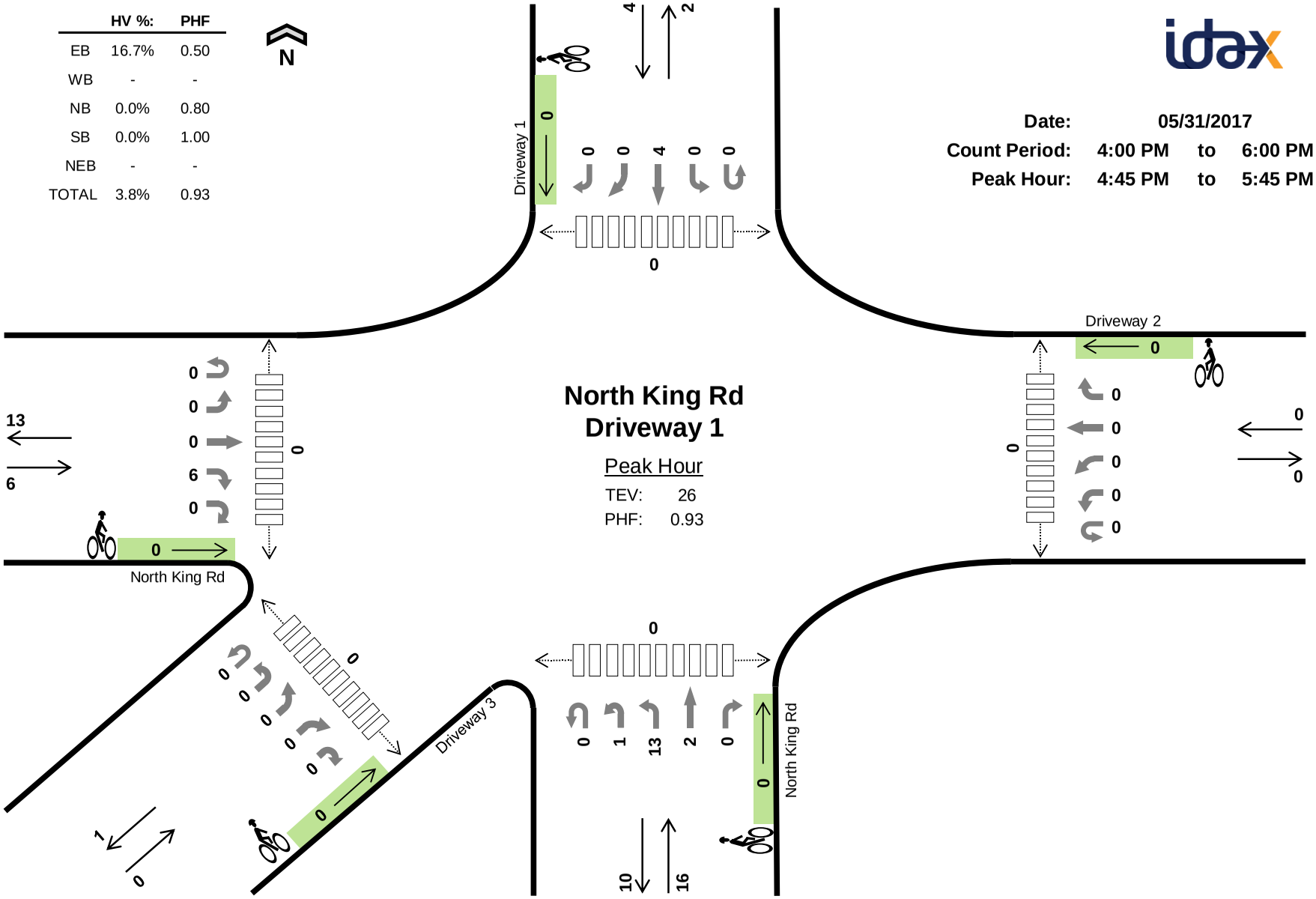
Traffic Count Data



Deon Fouche: 415 - 757 - 7714

deon.fouche@idaxdata.com

	HV %:	PHF
EB	16.7%	0.50
WB	-	-
NB	0.0%	0.80
SB	0.0%	1.00
NEB	-	-
TOTAL	3.8%	0.93



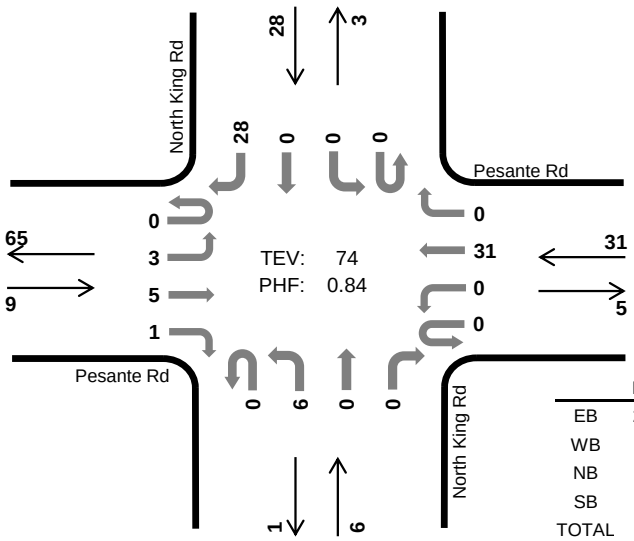
Deon Fouche: 415 - 757 - 7714

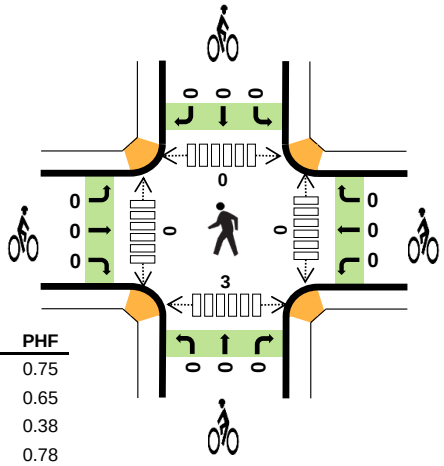
deon.fouche@idaxdata.com

North King Rd
Pesante Rd

Date: 05/31/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM

Peak Hour





	HV %:	PHF
EB	22.2%	0.75
WB	6.5%	0.65
NB	0.0%	0.38
SB	0.0%	0.78
TOTAL	5.4%	0.84

Two-Hour Count Summaries

Interval Start		Pesante Rd Eastbound				Pesante Rd Westbound				North King Rd Northbound				North King Rd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	7	11	0
7:15 AM		**0**	**2**	**1**	**0**	**0**	**0**	**12**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	**20**	0
7:30 AM		**0**	**0**	**2**	**0**	**0**	**0**	**8**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**8**	**22**	0
7:45 AM		**0**	**0**	**2**	**1**	**0**	**0**	**6**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**9**	**19**	72
8:00 AM		**0**	**1**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**13**	**74**
8:15 AM		0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	3	6	60
8:30 AM		0	2	1	0	0	0	5	0	0	0	0	0	0	0	0	4	12	50
8:45 AM		0	0	1	0	0	0	6	0	0	0	0	0	0	0	0	1	8	39
Count Total		0	6	7	2	0	0	46	0	0	7	0	0	0	0	0	43	111	0
Peak Hour	**All**	**0**	**3**	**5**	**1**	**0**	**0**	**31**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**28**	**74**	**0**
	HV	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**
	HV%	**-**	**0%**	**40%**	**0%**	**-**	**-**	**6%**	**-**	**-**	**0%**	**-**	**-**	**-**	**-**	**-**	**0%**	**5%**	**0**

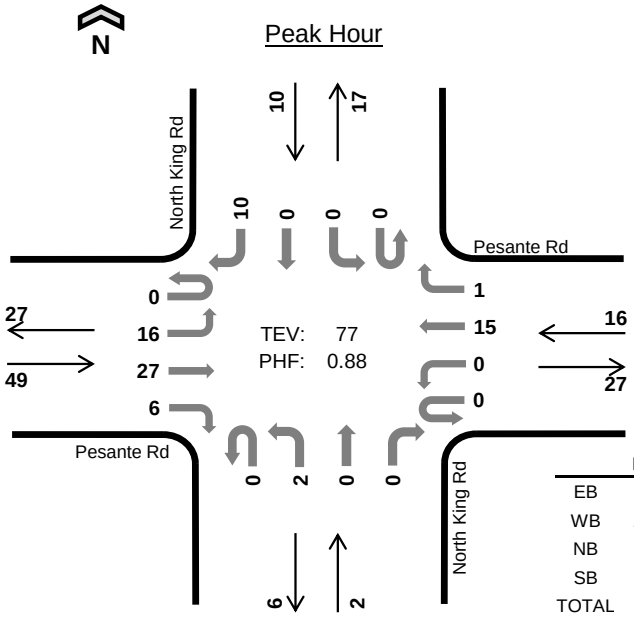
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

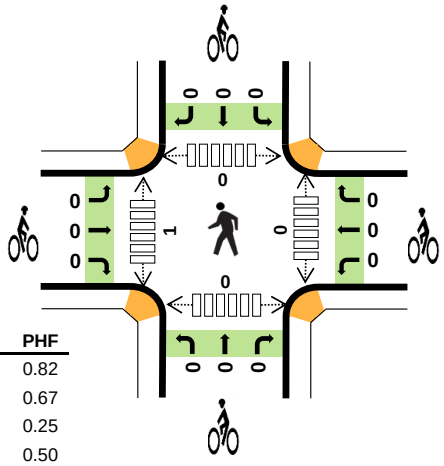
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	0	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
7:30 AM	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**2**	*2*
7:45 AM	**0**	**1**	**0**	**0**	***1***	**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**	***0***
8:15 AM	0	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	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	3	2	0	1	*6*	0	0	0	0	*0*	0	0	0	3	*3*
Peak Hour	**2**	**2**	**0**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**3**	***3***

North King Rd
Pesante Rd

Date: 05/31/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Peak Hour





	HV %:	PHF
EB	6.1%	0.82
WB	12.5%	0.67
NB	0.0%	0.25
SB	0.0%	0.50
TOTAL	6.5%	0.88

Two-Hour Count Summaries

Interval Start		Pesante Rd Eastbound				Pesante Rd Westbound				North King Rd Northbound				North King Rd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		**0**	**4**	**8**	**3**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**19**	0
4:15 PM		**0**	**5**	**6**	**1**	**0**	**0**	**5**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**22**	0
4:30 PM		**0**	**4**	**6**	**1**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**18**	0
4:45 PM		**0**	**3**	**7**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**18**	**77**
5:00 PM		0	6	5	0	0	0	4	0	0	0	0	0	0	0	0	2	17	75
5:15 PM		0	5	7	1	0	0	1	0	0	1	0	0	0	0	0	2	17	70
5:30 PM		0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	3	13	65
5:45 PM		0	4	8	1	0	0	3	0	0	0	0	0	0	0	0	3	19	66
Count Total		0	36	52	8	0	0	23	1	0	3	0	0	0	0	0	20	143	0
Peak Hour	**All**	**0**	**16**	**27**	**6**	**0**	**0**	**15**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**10**	**77**	**0**
	HV	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**
	HV%	**-**	**0%**	**11%**	**0%**	**-**	**-**	**7%**	**100%**	**-**	**0%**	**-**	**-**	**-**	**-**	**-**	**0%**	**6%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

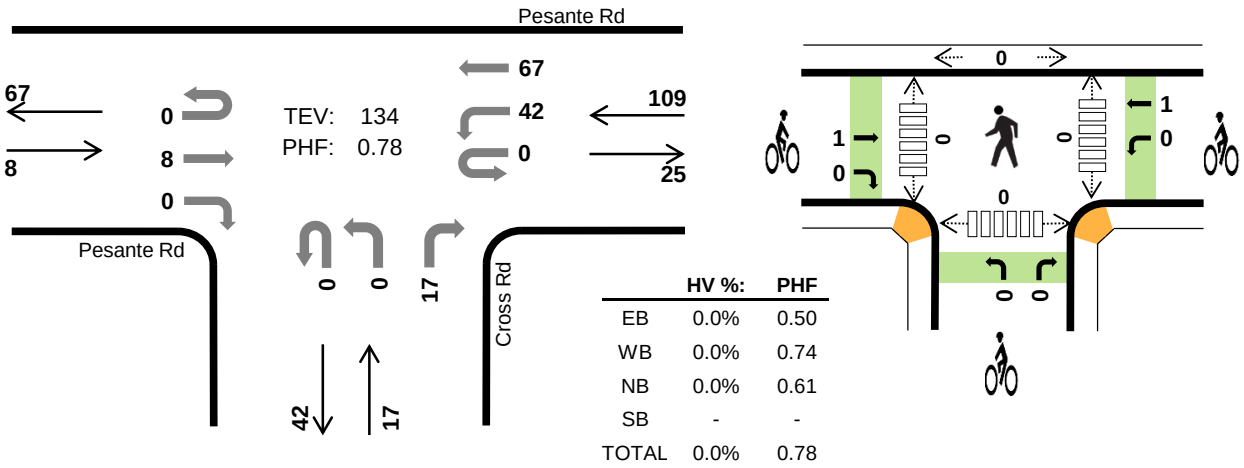
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:15 PM	**1**	**2**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
4:30 PM	**0**	**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**	***0***
5:00 PM	0	0	0	1	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	1	0	*1*
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	4	2	0	1	*7*	0	0	0	0	*0*	0	1	1	0	*2*
Peak Hour	**3**	**2**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	***1***

Cross Rd
Pesante Rd

N

Peak Hour

Date: 06/23/2016
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM



	HV %:	PHF
EB	0.0%	0.50
WB	0.0%	0.74
NB	0.0%	0.61
SB	-	-
TOTAL	0.0%	0.78

Two-Hour Count Summaries

Interval Start		Pesante Rd Eastbound				Pesante Rd Westbound				Cross Rd Northbound				0 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	0	0	9	15	0	0	0	0	4	0	0	0	0	28	0
7:15 AM		**0**	**0**	**4**	**0**	**0**	**7**	**18**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**35**	0
7:30 AM		**0**	**0**	**4**	**0**	**0**	**17**	**20**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**43**	0
7:45 AM		**0**	**0**	**0**	**0**	**0**	**11**	**12**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**25**	131
8:00 AM		**0**	**0**	**0**	**0**	**0**	**7**	**17**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**31**	**134**
8:15 AM		0	0	6	0	0	7	18	0	0	0	0	2	0	0	0	0	33	132
8:30 AM		0	0	1	0	0	3	10	0	0	0	0	6	0	0	0	0	20	109
8:45 AM		0	0	7	0	0	7	13	0	0	0	0	6	0	0	0	0	33	117
Count Total		0	0	22	0	0	68	123	0	0	0	0	35	0	0	0	0	248	0
Peak Hour	**All**	**0**	**0**	**8**	**0**	**0**	**42**	**67**	**0**	**0**	**0**	**0**	**17**	**0**	**0**	**0**	**0**	**134**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	HV%	**-**	**-**	**0%**	**-**	**-**	**0%**	**0%**	**-**	**-**	**-**	**-**	**0%**	**-**	**-**	**-**	**-**	**0%**	**0**

Note: Two-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
7:00 AM	0	2	0	0	*2*	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*
7:30 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**0**	**0**	**0**	**0**	***0***	**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	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	1	4	0	0	*5*	1	1	0	0	*2*	0	0	0	0	*0*
Peak Hr	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***

Deon Fouche: 415 - 757 - 7714

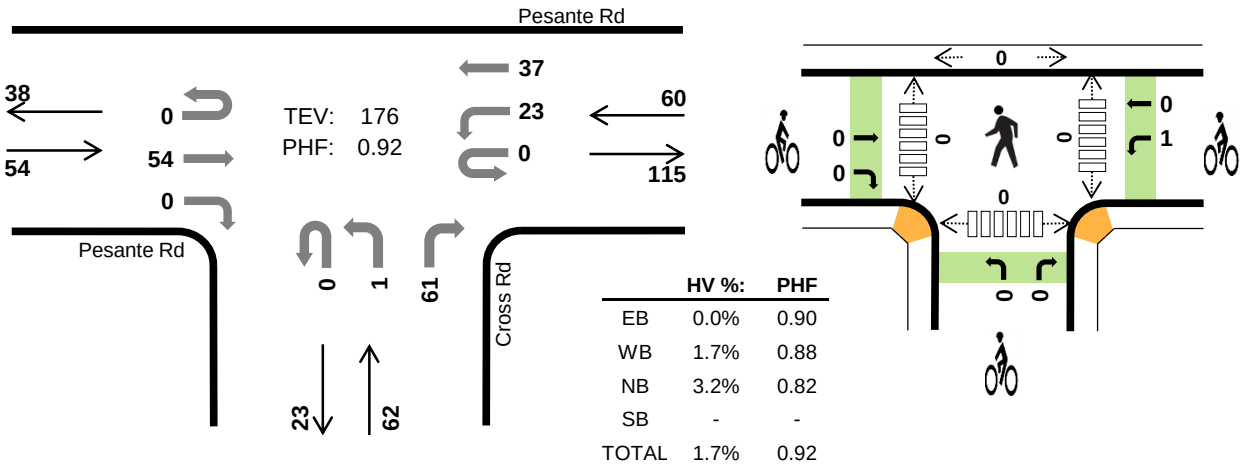
deon.fouche@idaxdata.com

Cross Rd
Pesante Rd

N

Peak Hour

Date: 06/23/2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM



	HV %:	PHF
EB	0.0%	0.90
WB	1.7%	0.88
NB	3.2%	0.82
SB	-	-
TOTAL	1.7%	0.92

Two-Hour Count Summaries

Interval Start	Pesante Rd Eastbound				Pesante Rd Westbound				Cross Rd Northbound				0 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	6	1	0	8	6	0	0	0	0	8	0	0	0	0	29	0
4:15 PM	**0**	**0**	**14**	**0**	**0**	**4**	**10**	**0**	**0**	**0**	**0**	**13**	**0**	**0**	**0**	**0**	**41**	0
4:30 PM	**0**	**0**	**13**	**0**	**0**	**6**	**8**	**0**	**0**	**0**	**0**	**15**	**0**	**0**	**0**	**0**	**42**	0
4:45 PM	**0**	**0**	**12**	**0**	**0**	**8**	**9**	**0**	**0**	**0**	**0**	**19**	**0**	**0**	**0**	**0**	**48**	160
5:00 PM	**0**	**0**	**15**	**0**	**0**	**5**	**10**	**0**	**0**	**1**	**0**	**14**	**0**	**0**	**0**	**0**	**45**	**176**
5:15 PM	0	0	12	0	0	3	8	0	0	0	0	11	0	0	0	0	34	169
5:30 PM	0	0	14	0	0	2	8	0	0	0	0	18	0	0	0	0	42	169
5:45 PM	0	0	11	0	0	5	4	0	0	2	0	13	0	0	0	0	35	156
Count Total	0	0	97	1	0	41	63	0	0	3	0	111	0	0	0	0	316	0
Peak Hour All	**0**	**0**	**54**	**0**	**0**	**23**	**37**	**0**	**0**	**1**	**0**	**61**	**0**	**0**	**0**	**0**	**176**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**3**	**0**
Peak Hour HV%	**-**	**-**	**0%**	**-**	**-**	**0%**	**3%**	**-**	**-**	**0%**	**-**	**3%**	**-**	**-**	**-**	**-**	**2%**	**0**

Note: Two-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
4:00 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	**0**	**0**	**1**	**0**	***1***	**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**	*0*
4:45 PM	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**0**	**1**	**1**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	1	0	0	0	*1*
5:30 PM	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*
Count Total	0	2	2	0	*4*	0	1	0	0	*1*	1	0	0	0	*1*
Peak Hr	**0**	**1**	**2**	**0**	***3***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

Deon Fouche: 415 - 757 - 7714

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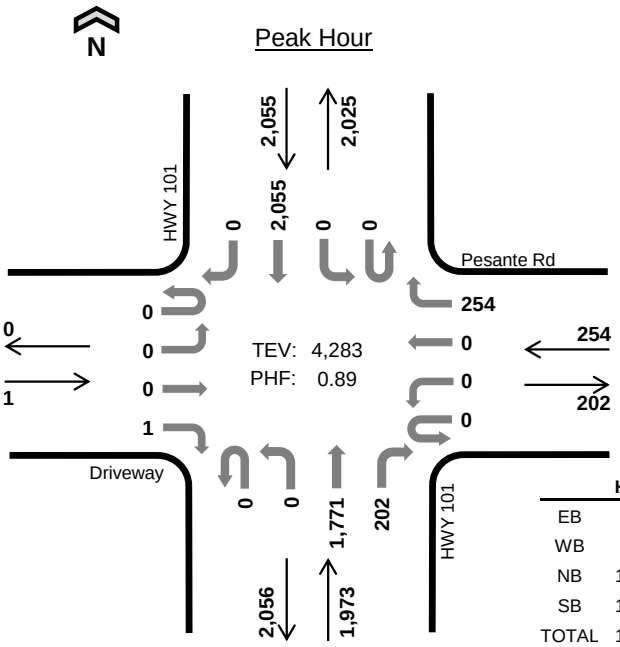
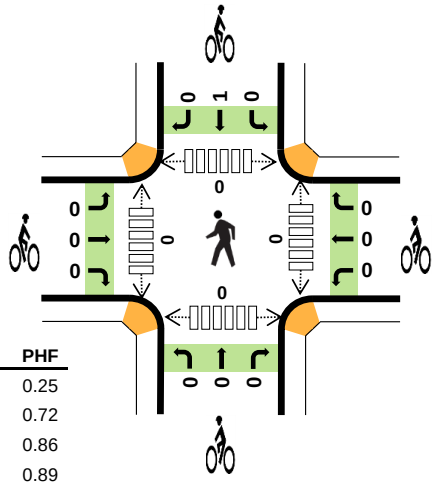
HWY 101
Pesante Rd

Date: 05/30/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM





	HV %:	PHF
EB	0.0%	0.25
WB	3.9%	0.72
NB	11.4%	0.86
SB	10.1%	0.89
TOTAL	10.3%	0.89

Two-Hour Count Summaries

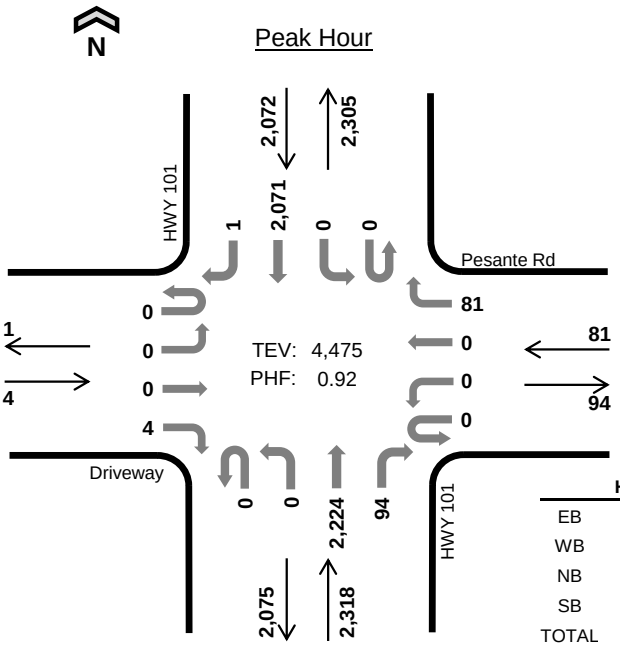
Interval Start		Driveway Eastbound				Pesante Rd Westbound				HWY 101 Northbound				HWY 101 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	0	0	0	0	28	0	0	411	23	0	0	409	0	871	0
7:15 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**50**	**0**	**0**	**414**	**42**	**0**	**0**	**479**	**0**	**985**	0
7:30 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**53**	**0**	**0**	**503**	**69**	**0**	**0**	**578**	**0**	**1,203**	0
7:45 AM		**0**	**0**	**0**	**1**	**0**	**0**	**0**	**88**	**0**	**0**	**404**	**64**	**0**	**0**	**514**	**0**	**1,071**	4,130
8:00 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**63**	**0**	**0**	**450**	**27**	**0**	**0**	**484**	**0**	**1,024**	**4,283**
8:15 AM		0	0	0	0	0	0	0	30	0	0	383	24	0	0	441	0	878	4,176
8:30 AM		0	0	0	0	0	0	0	23	0	0	401	28	0	0	386	0	838	3,811
8:45 AM		0	0	0	0	0	0	0	24	0	0	386	17	0	0	411	0	838	3,578
Count Total		0	0	0	1	0	0	0	359	0	0	3,352	294	0	0	3,702	0	7,708	0
Peak Hour	**All**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**254**	**0**	**0**	**1,771**	**202**	**0**	**0**	**2,055**	**0**	**4,283**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**0**	**0**	**219**	**6**	**0**	**0**	**208**	**0**	**443**	**0**
	HV%	**-**	**-**	**-**	**0%**	**-**	**-**	**-**	**4%**	**-**	**-**	**12%**	**3%**	**-**	**-**	**10%**	**-**	**10%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

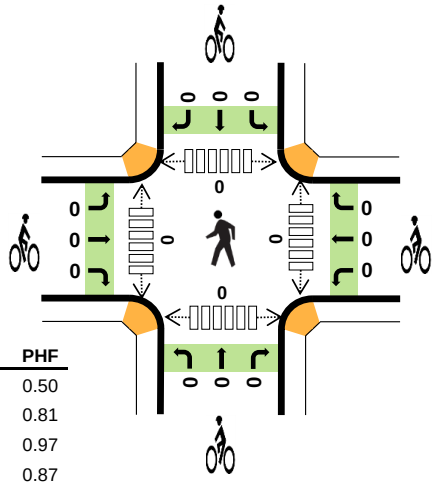
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	5	43	43	*91*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**0**	**3**	**51**	**45**	***99***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**0**	**2**	**62**	**48**	***112***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**4**	**53**	**48**	***105***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**0**	**1**	**59**	**67**	***127***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***
8:15 AM	0	0	62	46	*108*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	0	0	68	69	*137*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	75	55	*130*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	15	473	421	*909*	0	0	0	1	*1*	0	0	0	0	*0*
Peak Hour	**0**	**10**	**225**	**208**	***443***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***

HWY 101
Pesante Rd

Date: 05/30/2017
Count Period: 2:00 PM to 4:00 PM
Peak Hour: 3:00 PM to 4:00 PM



	HV %:	PHF
EB	0.0%	0.50
WB	3.7%	0.81
NB	8.3%	0.97
SB	9.9%	0.87
TOTAL	8.9%	0.92



Two-Hour Count Summaries

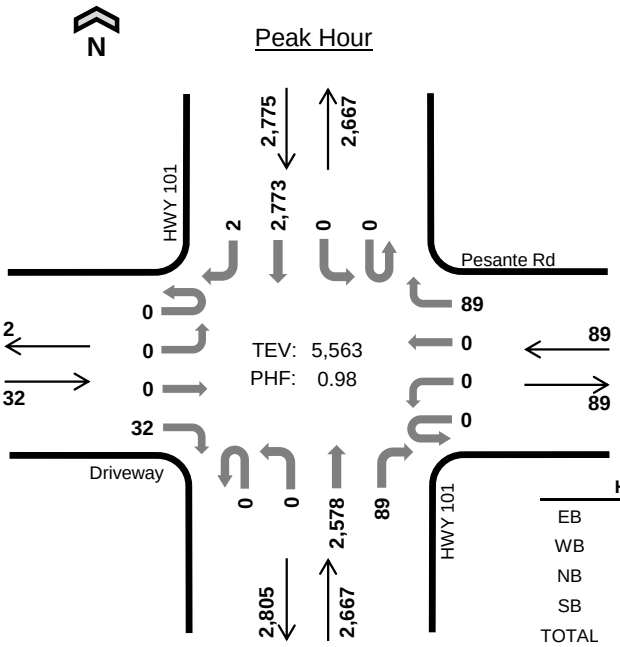
Interval Start	Driveway Eastbound				Pesante Rd Westbound				HWY 101 Northbound				HWY 101 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
2:00 PM	0	0	0	0	0	0	0	22	0	0	501	20	0	0	466	0	1,009	0
2:15 PM	0	0	0	0	0	0	0	30	0	0	491	22	0	0	485	0	1,028	0
2:30 PM	0	0	0	4	0	0	0	60	0	0	531	29	0	0	516	0	1,140	0
2:45 PM	0	0	0	2	0	0	0	45	0	0	510	26	0	0	496	0	1,079	4,256
3:00 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**25**	**0**	**0**	**521**	**27**	**0**	**0**	**430**	**1**	**1,005**	4,252
3:15 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**16**	**0**	**0**	**550**	**24**	**0**	**0**	**514**	**0**	**1,105**	4,329
3:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**19**	**0**	**0**	**576**	**23**	**0**	**0**	**530**	**0**	**1,148**	4,337
3:45 PM	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**21**	**0**	**0**	**577**	**20**	**0**	**0**	**597**	**0**	**1,217**	**4,475**
Count Total	0	0	0	10	0	0	0	238	0	0	4,257	191	0	0	4,034	1	8,731	0
Peak Hour All	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**81**	**0**	**0**	**2,224**	**94**	**0**	**0**	**2,071**	**1**	**4,475**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**191**	**1**	**0**	**0**	**205**	**0**	**400**	**0**
Peak Hour HV%	**-**	**-**	**-**	**0%**	**-**	**-**	**-**	**4%**	**-**	**-**	**9%**	**1%**	**-**	**-**	**10%**	**0%**	**9%**	**0**

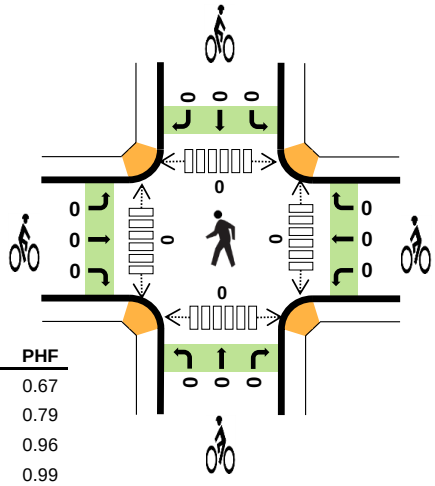
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
2:00 PM	0	3	60	71	*134*	0	0	0	0	*0*	0	0	0	0	*0*
2:15 PM	0	5	59	65	*129*	0	0	0	0	*0*	0	0	0	0	*0*
2:30 PM	1	3	61	68	*133*	0	0	0	0	*0*	0	0	0	0	*0*
2:45 PM	0	8	62	60	*130*	0	0	0	0	*0*	1	0	0	0	*1*
3:00 PM	**0**	**0**	**49**	**37**	***86***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
3:15 PM	**0**	**2**	**45**	**62**	***109***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
3:30 PM	**0**	**1**	**51**	**56**	***108***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
3:45 PM	**0**	**0**	**47**	**50**	***97***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	1	22	434	469	*926*	0	0	0	0	*0*	1	0	0	0	*1*
Peak Hour	**0**	**3**	**192**	**205**	***400***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

HWY 101
Pesante Rd

Date: 05/30/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	0.0%	0.67
WB	0.0%	0.79
NB	6.1%	0.96
SB	8.8%	0.99
TOTAL	7.3%	0.98

Two-Hour Count Summaries

Interval Start		Driveway Eastbound				Pesante Rd Westbound				HWY 101 Northbound				HWY 101 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	0	7	0	0	0	30	0	0	607	33	0	0	646	1	1,324	0
4:15 PM		0	0	0	3	0	0	0	20	0	0	609	31	0	0	647	2	1,312	0
4:30 PM		0	0	0	2	0	0	0	29	0	0	572	25	0	0	659	3	1,290	0
4:45 PM		**0**	**0**	**0**	**12**	**0**	**0**	**0**	**28**	**0**	**0**	**602**	**25**	**0**	**0**	**698**	**1**	**1,366**	5,292
5:00 PM		**0**	**0**	**0**	**2**	**0**	**0**	**0**	**26**	**0**	**0**	**671**	**26**	**0**	**0**	**696**	**0**	**1,421**	5,389
5:15 PM		**0**	**0**	**0**	**7**	**0**	**0**	**0**	**17**	**0**	**0**	**656**	**15**	**0**	**0**	**697**	**1**	**1,393**	5,470
5:30 PM		**0**	**0**	**0**	**11**	**0**	**0**	**0**	**18**	**0**	**0**	**649**	**23**	**0**	**0**	**682**	**0**	**1,383**	**5,563**
5:45 PM		0	0	0	4	0	0	0	21	0	0	559	18	0	0	607	2	1,211	5,408
Count Total		0	0	0	48	0	0	0	189	0	0	4,925	196	0	0	5,332	10	10,700	0
Peak Hour	**All**	**0**	**0**	**0**	**32**	**0**	**0**	**0**	**89**	**0**	**0**	**2,578**	**89**	**0**	**0**	**2,773**	**2**	**5,563**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**157**	**5**	**0**	**0**	**245**	**0**	**407**	**0**
	HV%	**-**	**-**	**-**	**0%**	**-**	**-**	**-**	**0%**	**-**	**-**	**6%**	**6%**	**-**	**-**	**9%**	**0%**	**7%**	**0**

Note: Two-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
4:00 PM	0	0	44	74	*118*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	0	50	71	*121*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	0	50	81	*131*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	**0**	**0**	**47**	**67**	***114***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**0**	**0**	**48**	**69**	***117***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**0**	**0**	**32**	**53**	***85***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:30 PM	**0**	**0**	**35**	**56**	***91***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:45 PM	0	0	36	44	*80*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	0	342	515	*857*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hour	**0**	**0**	**162**	**245**	***407***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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San Jose, CA

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File Name : 1AM FINAL
Site Code : 00000001
Start Date : 4/7/2016
Page No : 1

Groups Printed- Lights - Buses - Trucks

	PRUNEDALE SOUTH RD Southbound					BLACKIE RD Westbound					PRUNEDALE SOUTH RD Northbound					BLACKIE RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	3	1	3	0	7	3	10	15	0	28	21	1	31	0	53	8	14	5	2	29	117
07:15 AM	1	6	2	0	9	4	5	43	0	52	26	1	18	0	45	10	11	7	0	28	134
07:30 AM	3	5	4	0	12	1	11	73	0	85	48	3	21	0	72	19	23	3	0	45	214
07:45 AM	6	6	1	0	13	0	14	67	0	81	50	3	26	0	79	20	6	3	0	29	202
Total	13	18	10	0	41	8	40	198	0	246	145	8	96	0	249	57	54	18	2	131	667
08:00 AM	2	4	3	0	9	0	10	23	0	33	34	2	12	0	48	7	13	6	0	26	116
08:15 AM	7	2	2	0	11	3	11	22	0	36	23	2	25	0	50	6	8	9	0	23	120
08:30 AM	3	2	1	0	6	1	3	16	0	20	18	2	14	0	34	7	13	5	0	25	85
08:45 AM	3	2	0	0	5	1	6	37	0	44	18	1	10	0	29	5	10	4	0	19	97
Total	15	10	6	0	31	5	30	98	0	133	93	7	61	0	161	25	44	24	0	93	418
Grand Total	28	28	16	0	72	13	70	296	0	379	238	15	157	0	410	82	98	42	2	224	1085
Apprch %	38.9	38.9	22.2	0		3.4	18.5	78.1	0		58	3.7	38.3	0		36.6	43.8	18.8	0.9		
Total %	2.6	2.6	1.5	0	6.6	1.2	6.5	27.3	0	34.9	21.9	1.4	14.5	0	37.8	7.6	9	3.9	0.2	20.6	
Lights	26	27	15	0	68	12	64	275	0	351	236	15	149	0	400	78	87	38	2	205	1024
% Lights	92.9	96.4	93.8	0	94.4	92.3	91.4	92.9	0	92.6	99.2	100	94.9	0	97.6	95.1	88.8	90.5	100	91.5	94.4
Buses	1	0	0	0	1	0	2	18	0	20	1	0	0	0	1	1	0	2	0	3	25
% Buses	3.6	0	0	0	1.4	0	2.9	6.1	0	5.3	0.4	0	0	0	0.2	1.2	0	4.8	0	1.3	2.3
Trucks	1	1	1	0	3	1	4	3	0	8	1	0	8	0	9	3	11	2	0	16	36
% Trucks	3.6	3.6	6.2	0	4.2	7.7	5.7	1	0	2.1	0.4	0	5.1	0	2.2	3.7	11.2	4.8	0	7.1	3.3

	PRUNEDALE SOUTH RD Southbound				BLACKIE RD Westbound				PRUNEDALE SOUTH RD Northbound				BLACKIE RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	1	**6**	2	9	**4**	5	43	52	26	1	18	45	10	11	**7**	28	134
07:30 AM	3	5	**4**	12	1	11	**73**	**85**	48	**3**	21	72	19	**23**	3	**45**	**214**
07:45 AM	**6**	6	1	**13**	0	**14**	67	81	**50**	3	**26**	**79**	**20**	6	3	29	202
08:00 AM	2	4	3	9	0	10	23	33	34	2	12	48	7	13	6	26	116
Total Volume	12	21	10	43	5	40	206	251	158	9	77	244	56	53	19	128	666
% App. Total	27.9	48.8	23.3		2	15.9	82.1		64.8	3.7	31.6		43.8	41.4	14.8		
PHF	.500	.875	.625	.827	.313	.714	.705	.738	.790	.750	.740	.772	.700	.576	.679	.711	.778

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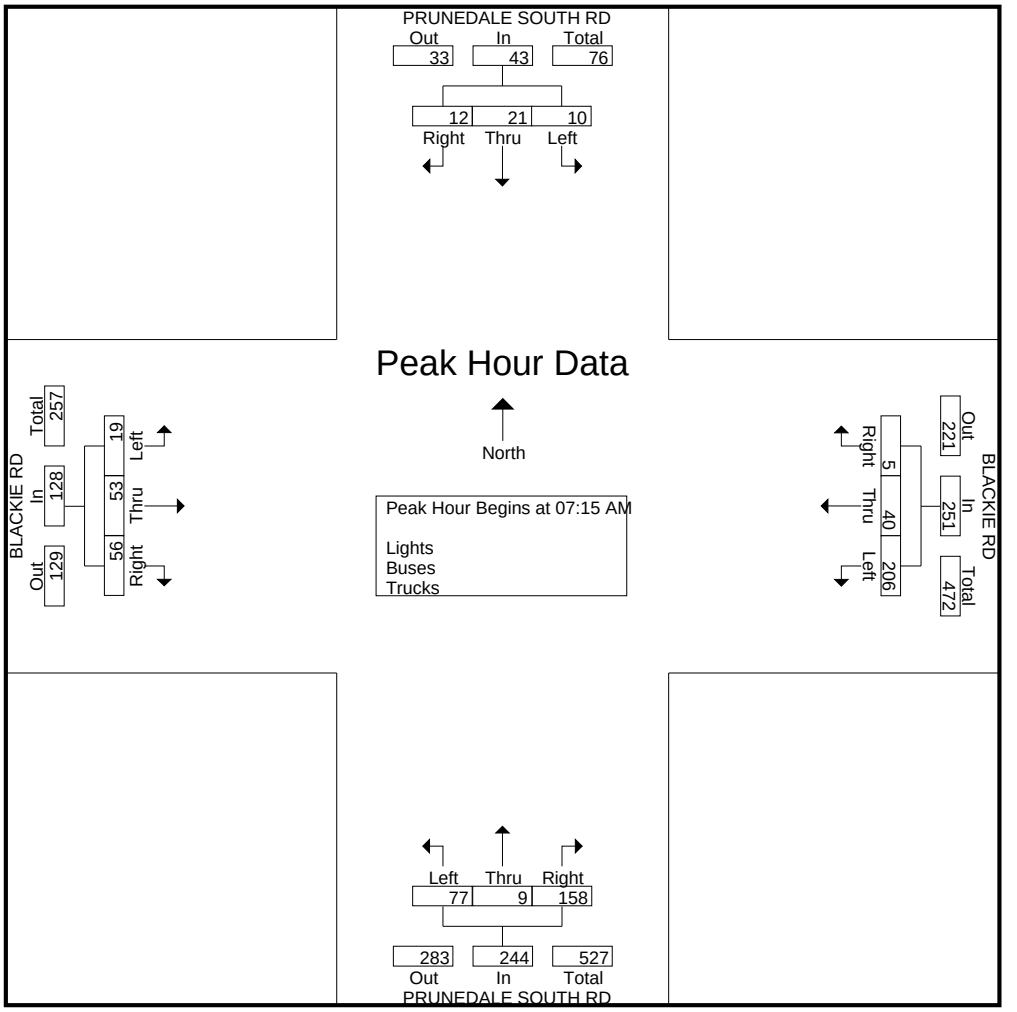
Page No : 2



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Page No : 1

Groups Printed- Lights - Buses - Trucks

	PRUNEDALE SOUTH RD Southbound					BLACKIE RD Westbound					PRUNEDALE SOUTH RD Northbound					BLACKIE RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	6	10	3	1	20	5	6	29	0	40	15	7	13	0	35	14	22	8	0	44	139
04:15 PM	2	11	4	0	17	2	5	42	0	49	12	7	11	0	30	16	16	14	0	46	142
04:30 PM	0	7	2	0	9	3	14	48	0	65	17	4	5	0	26	19	17	9	0	45	145
04:45 PM	0	5	2	0	7	6	6	34	0	46	13	4	11	0	28	19	31	16	0	66	147
Total	8	33	11	1	53	16	31	153	0	200	57	22	40	0	119	68	86	47	0	201	573
05:00 PM	5	9	2	0	16	4	12	36	0	52	14	6	10	0	30	24	37	9	0	70	168
05:15 PM	2	4	2	0	8	4	6	38	0	48	11	5	16	0	32	15	26	19	0	60	148
05:30 PM	2	5	3	0	10	2	7	49	0	58	11	6	23	0	40	16	31	6	0	53	161
05:45 PM	6	5	2	0	13	3	7	52	0	62	14	5	10	0	29	11	11	7	0	29	133
Total	15	23	9	0	47	13	32	175	0	220	50	22	59	0	131	66	105	41	0	212	610
Grand Total	23	56	20	1	100	29	63	328	0	420	107	44	99	0	250	134	191	88	0	413	1183
Apprch %	23	56	20	1		6.9	15	78.1	0		42.8	17.6	39.6	0		32.4	46.2	21.3	0		
Total %	1.9	4.7	1.7	0.1	8.5	2.5	5.3	27.7	0	35.5	9	3.7	8.4	0	21.1	11.3	16.1	7.4	0	34.9	
Lights	22	56	20	1	99	29	58	310	0	397	107	44	95	0	246	130	186	85	0	401	1143
% Lights	95.7	100	100	100	99	100	92.1	94.5	0	94.5	100	100	96	0	98.4	97	97.4	96.6	0	97.1	96.6
Buses	0	0	0	0	0	0	0	13	0	13	0	0	1	0	1	2	0	0	0	2	16
% Buses	0	0	0	0	0	0	0	4	0	3.1	0	0	1	0	0.4	1.5	0	0	0	0.5	1.4
Trucks	1	0	0	0	1	0	5	5	0	10	0	0	3	0	3	2	5	3	0	10	24
% Trucks	4.3	0	0	0	1	0	7.9	1.5	0	2.4	0	0	3	0	1.2	1.5	2.6	3.4	0	2.4	2

	PRUNEDALE SOUTH RD Southbound				BLACKIE RD Westbound				PRUNEDALE SOUTH RD Northbound				BLACKIE RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	5	2	7	**6**	6	34	46	13	4	11	28	19	31	16	66	147
05:00 PM	**5**	**9**	2	**16**	4	**12**	36	52	**14**	**6**	10	30	**24**	**37**	9	**70**	**168**
05:15 PM	2	4	2	8	4	6	38	48	11	5	16	32	15	26	**19**	60	148
05:30 PM	2	5	**3**	10	2	7	**49**	**58**	11	6	**23**	**40**	16	31	6	53	161
Total Volume	9	23	9	41	16	31	157	204	49	21	60	130	74	125	50	249	624
% App. Total	22	56.1	22		7.8	15.2	77		37.7	16.2	46.2		29.7	50.2	20.1		
PHF	.450	.639	.750	.641	.667	.646	.801	.879	.875	.875	.652	.813	.771	.845	.658	.889	.929

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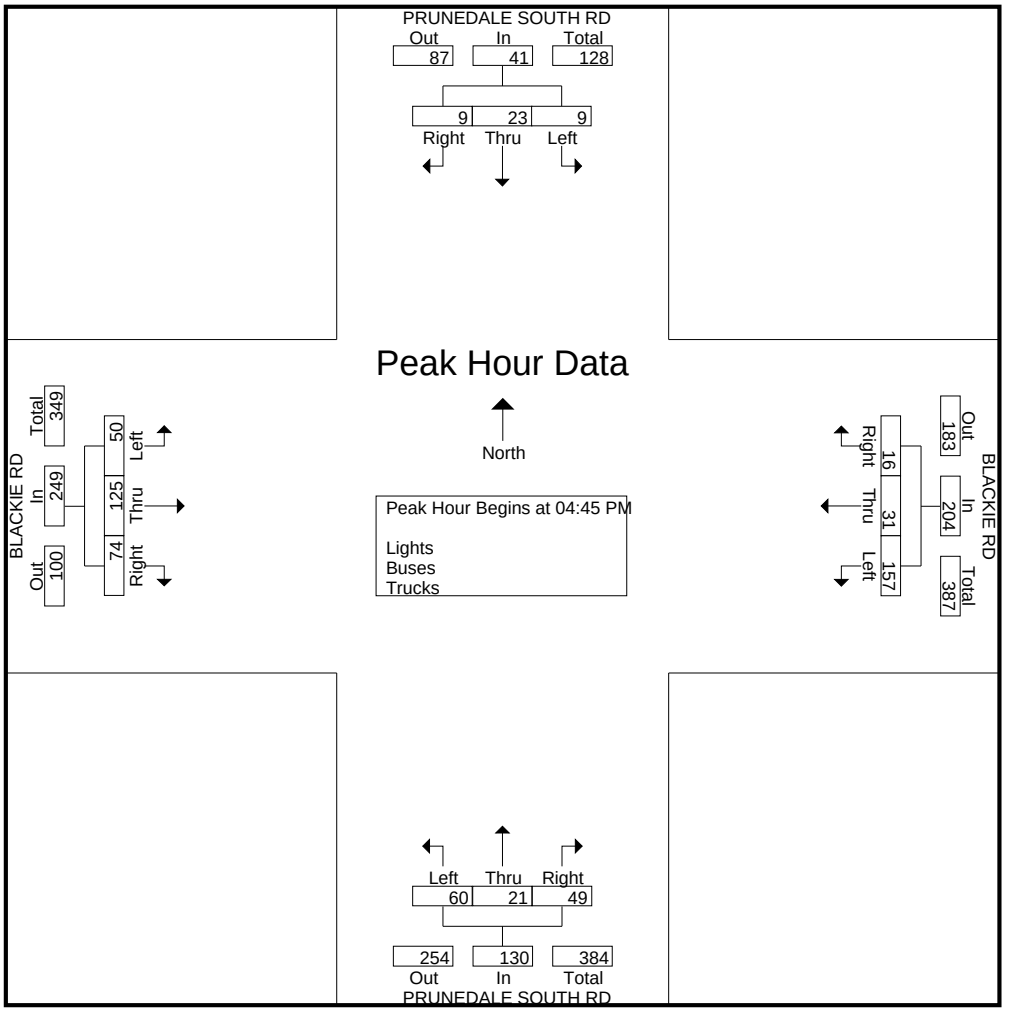
Page No : 2



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File Name : 2AM FINAL
Site Code : 00000002
Start Date : 4/7/2016
Page No : 1

Groups Printed- Lights - Buses - Trucks

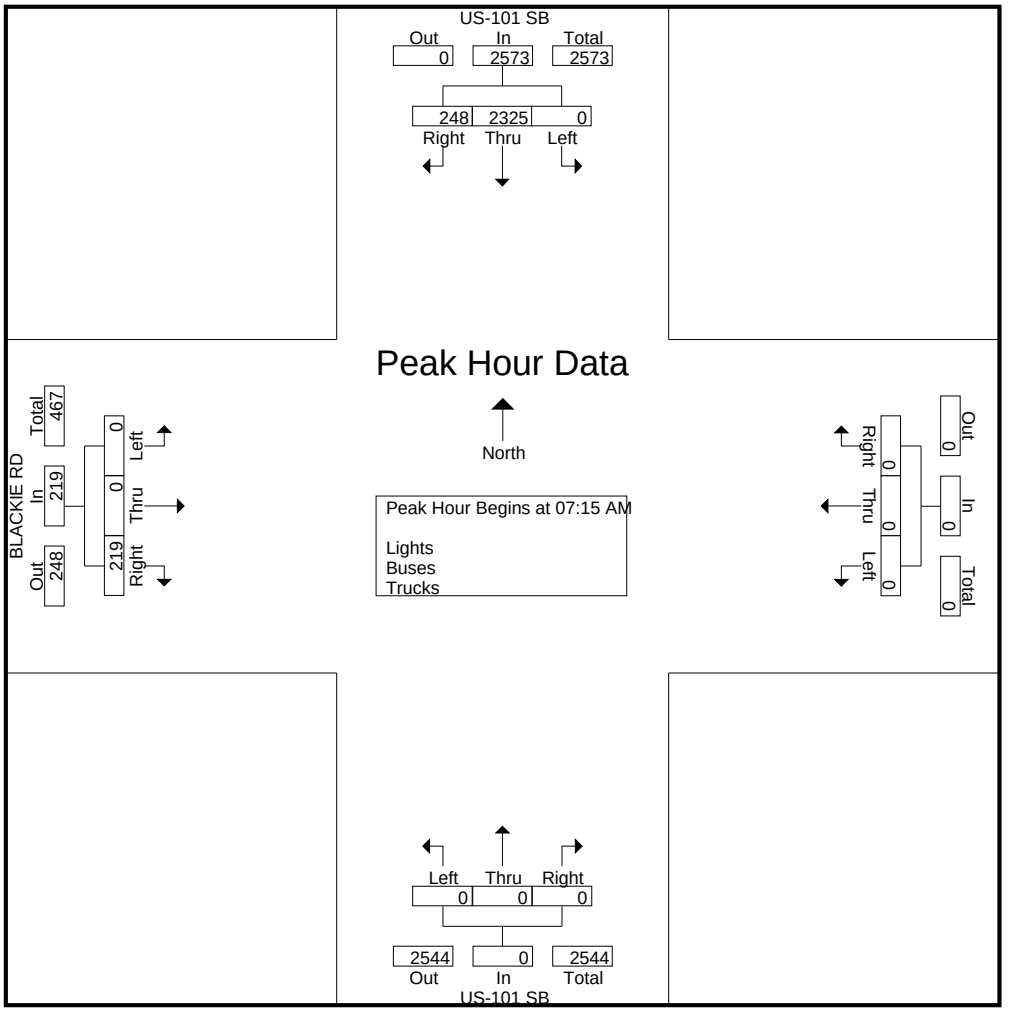
	US-101 SB Southbound					Westbound					US-101 SB Northbound					BLACKIE RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	28	421	0	0	449	0	0	0	0	0	0	0	0	0	0	35	0	0	0	35	484
07:15 AM	50	537	0	0	587	0	0	0	0	0	0	0	0	0	0	40	0	0	0	40	627
07:30 AM	87	683	0	0	770	0	0	0	0	0	0	0	0	0	0	71	0	0	0	71	841
07:45 AM	80	592	0	0	672	0	0	0	0	0	0	0	0	0	0	56	0	0	0	56	728
Total	245	2233	0	0	2478	0	0	0	0	0	0	0	0	0	0	202	0	0	0	202	2680
08:00 AM	31	513	0	0	544	0	0	0	0	0	0	0	0	0	0	52	0	0	0	52	596
08:15 AM	39	458	0	0	497	0	0	0	0	0	0	0	0	0	0	33	0	0	0	33	530
08:30 AM	20	427	0	0	447	0	0	0	0	0	0	0	0	0	0	30	0	0	0	30	477
08:45 AM	44	408	0	0	452	0	0	0	0	0	0	0	0	0	0	31	0	0	0	31	483
Total	134	1806	0	0	1940	0	0	0	0	0	0	0	0	0	0	146	0	0	0	146	2086
Grand Total	379	4039	0	0	4418	0	0	0	0	0	0	0	0	0	0	348	0	0	0	348	4766
Apprch %	8.6	91.4	0	0		0	0	0	0		0	0	0	0		100	0	0	0		
Total %	8	84.7	0	0	92.7	0	0	0	0	0	0	0	0	0	0	7.3	0	0	0	7.3	
Lights	351	3686	0	0	4037	0	0	0	0	0	0	0	0	0	0	334	0	0	0	334	4371
% Lights	92.6	91.3	0	0	91.4	0	0	0	0	0	0	0	0	0	0	96	0	0	0	96	91.7
Buses	20	8	0	0	28	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	29
% Buses	5.3	0.2	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0.3	0.6
Trucks	8	345	0	0	353	0	0	0	0	0	0	0	0	0	0	13	0	0	0	13	366
% Trucks	2.1	8.5	0	0	8	0	0	0	0	0	0	0	0	0	0	3.7	0	0	0	3.7	7.7

	US-101 SB Southbound				Westbound				US-101 SB Northbound				BLACKIE RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	50	537	0	587	0	0	0	0	0	0	0	0	40	0	0	40	627
07:30 AM	**87**	**683**	0	**770**	0	0	0	0	0	0	0	0	**71**	0	0	**71**	**841**
07:45 AM	80	592	0	672	0	0	0	0	0	0	0	0	56	0	0	56	728
08:00 AM	31	513	0	544	0	0	0	0	0	0	0	0	52	0	0	52	596
Total Volume	248	2325	0	2573	0	0	0	0	0	0	0	0	219	0	0	219	2792
% App. Total	9.6	90.4	0		0	0	0		0	0	0		100	0	0		
PHF	.713	.851	.000	.835	.000	.000	.000	.000	.000	.000	.000	.000	.771	.000	.000	.771	.830

Traffic Data Service

San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 2AM FINAL
Site Code : 00000002
Start Date : 4/7/2016
Page No : 2



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San Jose, CA

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File Name : 2PM FINAL
Site Code : 00000002
Start Date : 4/7/2016
Page No : 1

Groups Printed- Lights - Buses - Trucks

	US-101 SB Southbound					Westbound					US-101 SB Northbound					BLACKIE RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	41	634	0	0	675	0	0	0	0	0	0	0	0	0	0	39	0	0	0	39	714
04:15 PM	47	587	0	0	634	0	0	0	0	0	0	0	0	0	0	32	0	0	0	32	666
04:30 PM	63	619	0	0	682	0	0	0	0	0	0	0	0	0	0	33	0	0	0	33	715
04:45 PM	45	636	0	0	681	0	0	0	0	0	0	0	0	0	0	48	0	0	0	48	729
Total	196	2476	0	0	2672	0	0	0	0	0	0	0	0	0	0	152	0	0	0	152	2824
05:00 PM	50	610	0	0	660	0	0	0	0	0	0	0	0	0	0	50	0	0	0	50	710
05:15 PM	48	616	0	0	664	0	0	0	0	0	0	0	0	0	0	44	0	0	0	44	708
05:30 PM	56	653	0	0	709	0	0	0	0	0	0	0	0	0	0	44	0	0	0	44	753
05:45 PM	62	609	0	0	671	0	0	0	0	0	0	0	0	0	0	26	0	0	0	26	697
Total	216	2488	0	0	2704	0	0	0	0	0	0	0	0	0	0	164	0	0	0	164	2868
Grand Total	412	4964	0	0	5376	0	0	0	0	0	0	0	0	0	0	316	0	0	0	316	5692
Apprch %	7.7	92.3	0	0		0	0	0	0		0	0	0	0		100	0	0	0		
Total %	7.2	87.2	0	0	94.4	0	0	0	0	0	0	0	0	0	0	5.6	0	0	0	5.6	
Lights	390	4596	0	0	4986	0	0	0	0	0	0	0	0	0	0	309	0	0	0	309	5295
% Lights	94.7	92.6	0	0	92.7	0	0	0	0	0	0	0	0	0	0	97.8	0	0	0	97.8	93
Buses	13	20	0	0	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33
% Buses	3.2	0.4	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6
Trucks	9	348	0	0	357	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7	364
% Trucks	2.2	7	0	0	6.6	0	0	0	0	0	0	0	0	0	0	2.2	0	0	0	2.2	6.4

	US-101 SB Southbound				Westbound				US-101 SB Northbound				BLACKIE RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	45	636	0	681	0	0	0	0	0	0	0	0	48	0	0	48	729
05:00 PM	50	610	0	660	0	0	0	0	0	0	0	0	**50**	0	0	**50**	710
05:15 PM	48	616	0	664	0	0	0	0	0	0	0	0	44	0	0	44	708
05:30 PM	**56**	**653**	0	**709**	0	0	0	0	0	0	0	0	44	0	0	44	**753**
Total Volume	199	2515	0	2714	0	0	0	0	0	0	0	0	186	0	0	186	2900
% App. Total	7.3	92.7	0		0	0	0		0	0	0		100	0	0		
PHF	.888	.963	.000	.957	.000	.000	.000	.000	.000	.000	.000	.000	.930	.000	.000	.930	.963

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File Name : 2PM FINAL
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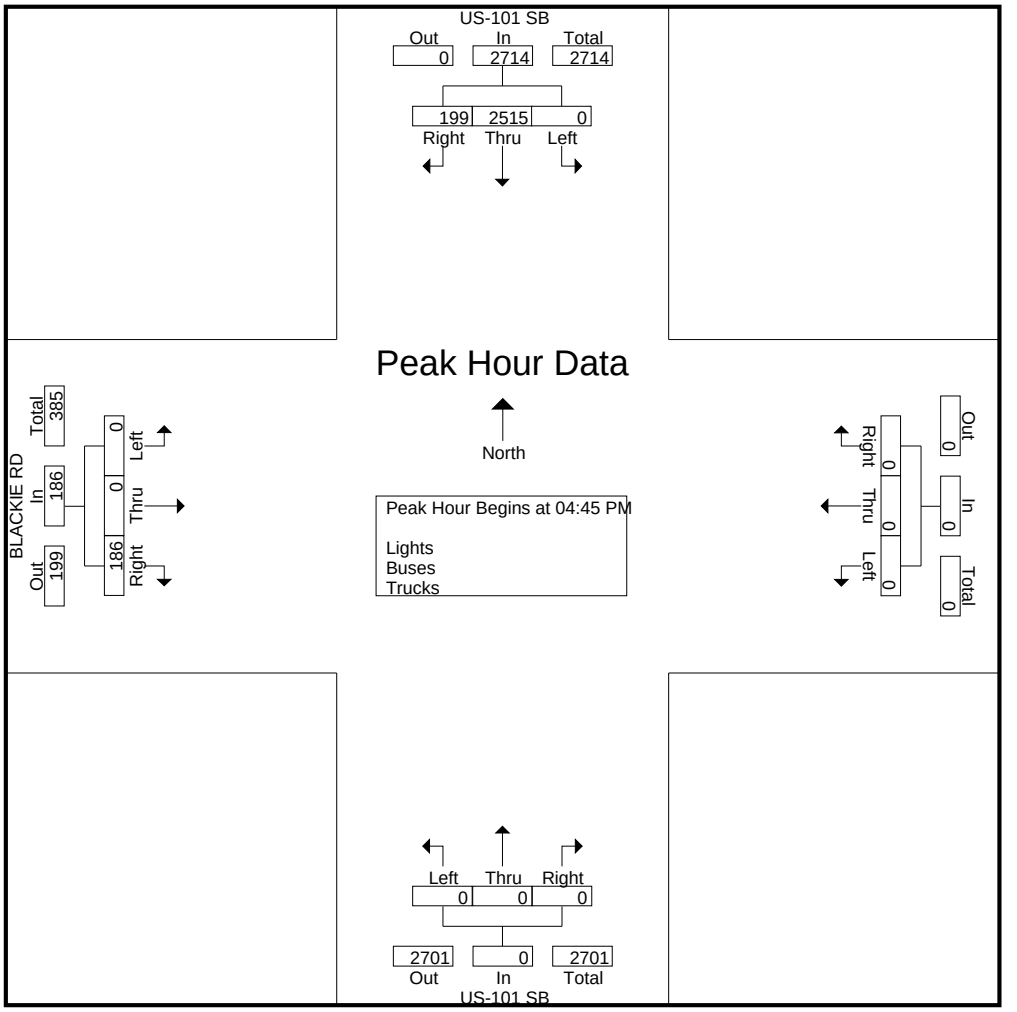
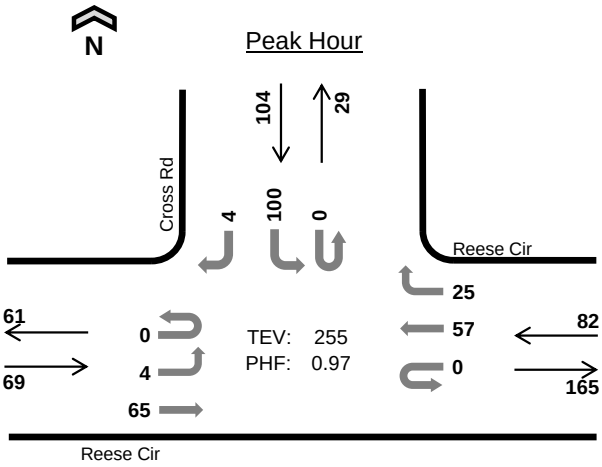
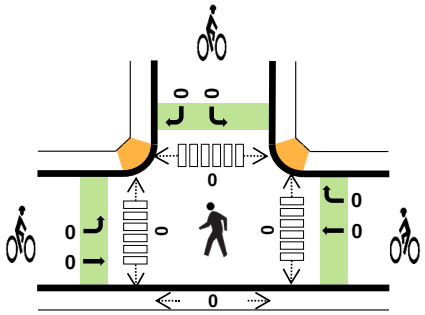
Page No : 2



Cross Rd
Reese Cir



Date: 06/23/2016
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:00 AM to 8:00 AM



	HV %:	PHF
EB	8.7%	0.86
WB	2.4%	0.85
NB	-	-
SB	0.0%	0.87
TOTAL	3.1%	0.97

Two-Hour Count Summaries

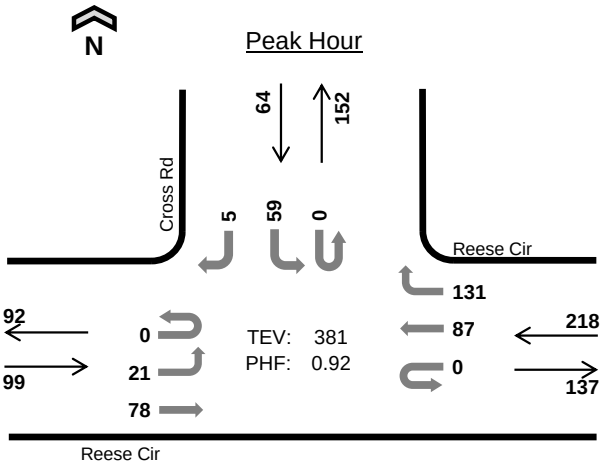
Interval Start		Reese Cir Eastbound				Reese Cir Westbound				0 Northbound				Cross Rd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		**0**	**1**	**19**	**0**	**0**	**0**	**13**	**5**	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**2**	**60**	0
7:15 AM		**0**	**0**	**18**	**0**	**0**	**0**	**11**	**8**	**0**	**0**	**0**	**0**	**0**	**28**	**0**	**0**	**65**	0
7:30 AM		**0**	**0**	**12**	**0**	**0**	**0**	**18**	**6**	**0**	**0**	**0**	**0**	**0**	**30**	**0**	**0**	**66**	0
7:45 AM		**0**	**3**	**16**	**0**	**0**	**0**	**15**	**6**	**0**	**0**	**0**	**0**	**0**	**22**	**0**	**2**	**64**	**255**
8:00 AM		0	1	10	0	0	0	10	14	0	0	0	0	0	20	0	0	55	250
8:15 AM		0	0	11	0	0	0	17	5	0	0	0	0	0	17	0	3	53	238
8:30 AM		0	3	13	0	0	0	13	10	0	0	0	0	0	10	0	0	49	221
8:45 AM		0	0	18	0	0	0	16	8	0	0	0	0	0	20	0	0	62	219
Count Total		0	8	117	0	0	0	113	62	0	0	0	0	0	167	0	7	474	0
Peak Hour	**All**	**0**	**4**	**65**	**0**	**0**	**0**	**57**	**25**	**0**	**0**	**0**	**0**	**0**	**100**	**0**	**4**	**255**	**0**
	HV	**0**	**0**	**6**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**
	HV%	**-**	**0%**	**9%**	**-**	**-**	**-**	**2%**	**4%**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**3%**	**0**

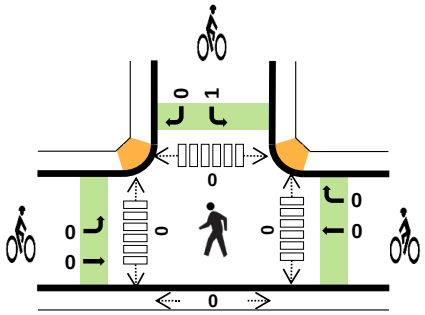
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:15 AM	**3**	**0**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**2**	**1**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	0	6	0	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
8:15 AM	0	5	0	1	*6*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	2	1	0	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	1	2	0	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	9	16	0	1	*26*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**6**	**2**	**0**	**0**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Cross Rd
Reese Cir

Date: 06/23/2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	3.0%	0.75
WB	1.4%	0.87
NB	-	-
SB	0.0%	0.84
TOTAL	1.6%	0.92

Two-Hour Count Summaries

Interval Start		Reese Cir Eastbound				Reese Cir Westbound				0 Northbound				Cross Rd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	5	17	0	0	0	19	20	0	0	0	0	0	15	0	0	76	0
4:15 PM		0	3	17	0	0	0	16	22	0	0	0	0	0	13	0	3	74	0
4:30 PM		0	1	8	0	0	0	19	31	0	0	0	0	0	13	0	2	74	0
4:45 PM		**0**	**10**	**23**	**0**	**0**	**0**	**23**	**33**	**0**	**0**	**0**	**0**	**0**	**14**	**0**	**0**	**103**	327
5:00 PM		**0**	**5**	**14**	**0**	**0**	**0**	**23**	**34**	**0**	**0**	**0**	**0**	**0**	**16**	**0**	**1**	**93**	344
5:15 PM		**0**	**2**	**24**	**0**	**0**	**0**	**15**	**27**	**0**	**0**	**0**	**0**	**0**	**16**	**0**	**3**	**87**	357
5:30 PM		**0**	**4**	**17**	**0**	**0**	**0**	**26**	**37**	**0**	**0**	**0**	**0**	**0**	**13**	**0**	**1**	**98**	**381**
5:45 PM		0	5	16	0	0	0	12	31	0	0	0	0	0	8	0	1	73	351
Count Total		0	35	136	0	0	0	153	235	0	0	0	0	0	108	0	11	678	0
Peak Hour	**All**	**0**	**21**	**78**	**0**	**0**	**0**	**87**	**131**	**0**	**0**	**0**	**0**	**0**	**59**	**0**	**5**	**381**	**0**
	HV	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**
	HV%	**-**	**0%**	**4%**	**-**	**-**	**-**	**2%**	**1%**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

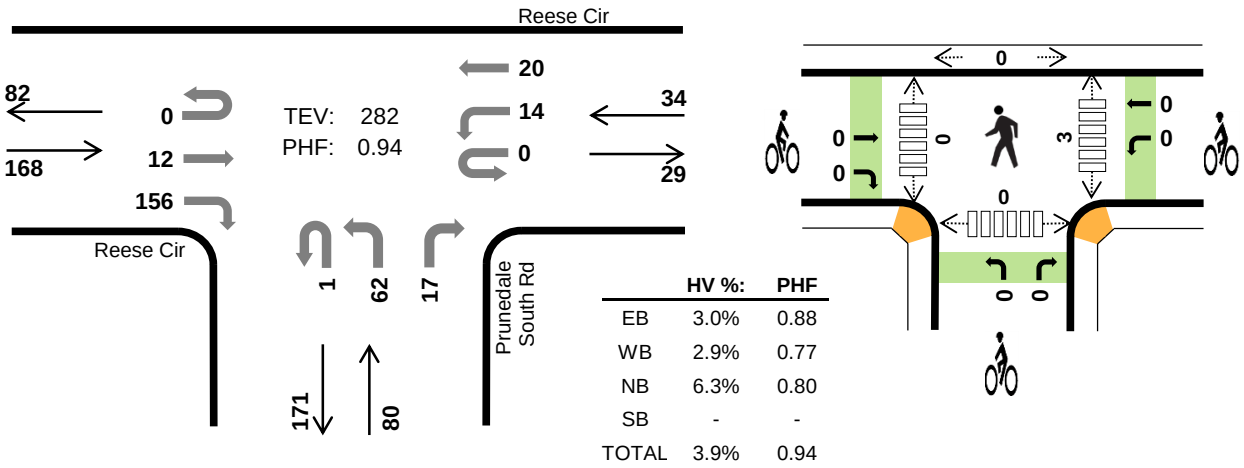
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	2	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	2	2	0	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	**1**	**2**	**0**	**0**	***3***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**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	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:45 PM	3	1	0	1	*5*	1	1	0	1	*3*	0	0	0	0	*0*
Count Total	8	8	0	1	*17*	1	1	0	2	*4*	0	0	0	0	*0*
Peak Hr	**3**	**3**	**0**	**0**	***6***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***

Prunedale South Rd
Reese Cir

N

Peak Hour

Date: 06/23/2016
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:00 AM to 8:00 AM



	HV %:	PHF
EB	3.0%	0.88
WB	2.9%	0.77
NB	6.3%	0.80
SB	-	-
TOTAL	3.9%	0.94

Two-Hour Count Summaries

Interval Start		Reese Cir Eastbound				Reese Cir Westbound				Prunedale South Rd Northbound				0 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		**0**	**0**	**0**	**39**	**0**	**6**	**5**	**0**	**0**	**11**	**0**	**4**	**0**	**0**	**0**	**0**	**65**	0
7:15 AM		**0**	**0**	**4**	**44**	**0**	**1**	**5**	**0**	**0**	**14**	**0**	**3**	**0**	**0**	**0**	**0**	**71**	0
7:30 AM		**0**	**0**	**5**	**38**	**0**	**3**	**6**	**0**	**1**	**18**	**0**	**4**	**0**	**0**	**0**	**0**	**75**	0
7:45 AM		**0**	**0**	**3**	**35**	**0**	**4**	**4**	**0**	**0**	**19**	**0**	**6**	**0**	**0**	**0**	**0**	**71**	**282**
8:00 AM		0	0	2	28	0	3	3	0	0	19	0	2	0	0	0	0	57	274
8:15 AM		0	0	5	23	0	6	9	0	0	13	0	3	0	0	0	0	59	262
8:30 AM		0	0	2	21	0	5	4	0	1	19	0	3	0	0	0	0	55	242
8:45 AM		0	0	6	32	0	6	7	0	0	14	0	1	0	0	0	0	66	237
Count Total		0	0	27	260	0	34	43	0	2	127	0	26	0	0	0	0	519	0
Peak Hour	**All**	**0**	**0**	**12**	**156**	**0**	**14**	**20**	**0**	**1**	**62**	**0**	**17**	**0**	**0**	**0**	**0**	**282**	**0**
	HV	**0**	**0**	**1**	**4**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**3**	**0**	**0**	**0**	**0**	**11**	**0**
	HV%	**-**	**-**	**8%**	**3%**	**-**	**7%**	**0%**	**-**	**0%**	**3%**	**-**	**18%**	**-**	**-**	**-**	**-**	**4%**	**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	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:15 AM	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
7:30 AM	**2**	**1**	**3**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**0**	***2***
8:00 AM	0	0	6	0	*6*	0	0	0	0	*0*	2	0	0	0	*2*
8:15 AM	1	0	5	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	2	0	4	0	*6*	0	0	0	0	*0*	1	0	0	1	*2*
8:45 AM	1	1	1	0	*3*	0	0	0	0	*0*	3	0	0	0	*3*
Count Total	9	2	21	0	*32*	0	0	0	0	*0*	9	0	0	1	*10*
Peak Hr	**5**	**1**	**5**	**0**	***11***	**0**	**0**	**0**	**0**	***0***	**3**	**0**	**0**	**0**	***3***

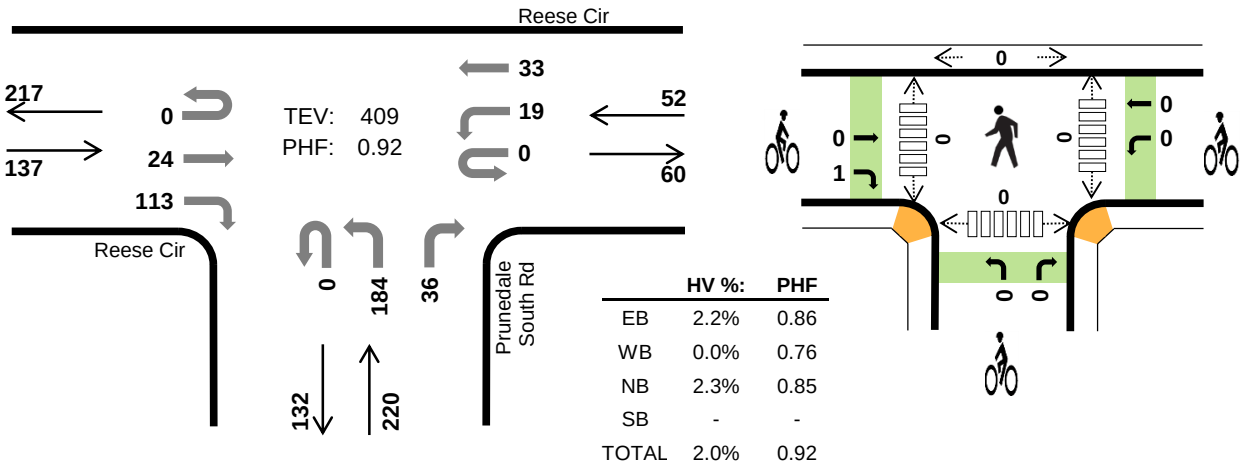
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Prunedale South Rd
Reese Cir

N

Peak Hour

Date: 06/23/2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM



	HV %:	PHF
EB	2.2%	0.86
WB	0.0%	0.76
NB	2.3%	0.85
SB	-	-
TOTAL	2.0%	0.92

Two-Hour Count Summaries

Interval Start		Reese Cir Eastbound				Reese Cir Westbound				Prunedale South Rd Northbound				0 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	9	23	0	9	7	0	0	30	0	10	0	0	0	0	88	0
4:15 PM		0	0	3	26	0	4	3	0	0	38	0	11	0	0	0	0	85	0
4:30 PM		0	0	6	15	0	3	9	0	0	38	0	9	0	0	0	0	80	0
4:45 PM		**0**	**0**	**6**	**31**	**0**	**7**	**8**	**0**	**0**	**49**	**0**	**6**	**0**	**0**	**0**	**0**	**107**	360
5:00 PM		**0**	**0**	**8**	**23**	**0**	**3**	**6**	**0**	**0**	**48**	**0**	**7**	**0**	**0**	**0**	**0**	**95**	367
5:15 PM		**0**	**0**	**7**	**33**	**0**	**3**	**8**	**0**	**0**	**37**	**0**	**8**	**0**	**0**	**0**	**0**	**96**	378
5:30 PM		**0**	**0**	**3**	**26**	**0**	**6**	**11**	**0**	**0**	**50**	**0**	**15**	**0**	**0**	**0**	**0**	**111**	**409**
5:45 PM		0	0	6	18	0	6	6	0	0	39	0	8	0	0	0	0	83	385
Count Total		0	0	48	195	0	41	58	0	0	329	0	74	0	0	0	0	745	0
Peak Hour	**All**	**0**	**0**	**24**	**113**	**0**	**19**	**33**	**0**	**0**	**184**	**0**	**36**	**0**	**0**	**0**	**0**	**409**	**0**
	HV	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**2**	**0**	**0**	**0**	**0**	**8**	**0**
	HV%	**-**	**-**	**0%**	**3%**	**-**	**0%**	**0%**	**-**	**-**	**2%**	**-**	**6%**	**-**	**-**	**-**	**-**	**2%**	**0**

Note: Two-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
4:00 PM	0	2	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	2	1	1	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	**1**	**0**	**2**	**0**	***3***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**1**	**0**	**2**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**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	**1**	**0**	**1**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:45 PM	3	0	2	0	*5*	1	1	0	0	*2*	4	0	0	0	*4*
Count Total	8	4	8	0	*20*	2	1	0	0	*3*	4	0	0	0	*4*
Peak Hr	**3**	**0**	**5**	**0**	***8***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Mott MacDonald

1300-B First Street
Gilroy, CA 95020

File Name : 383280ako1-cars
Site Code : 00000000
Start Date : 8/23/2017
Page No : 1

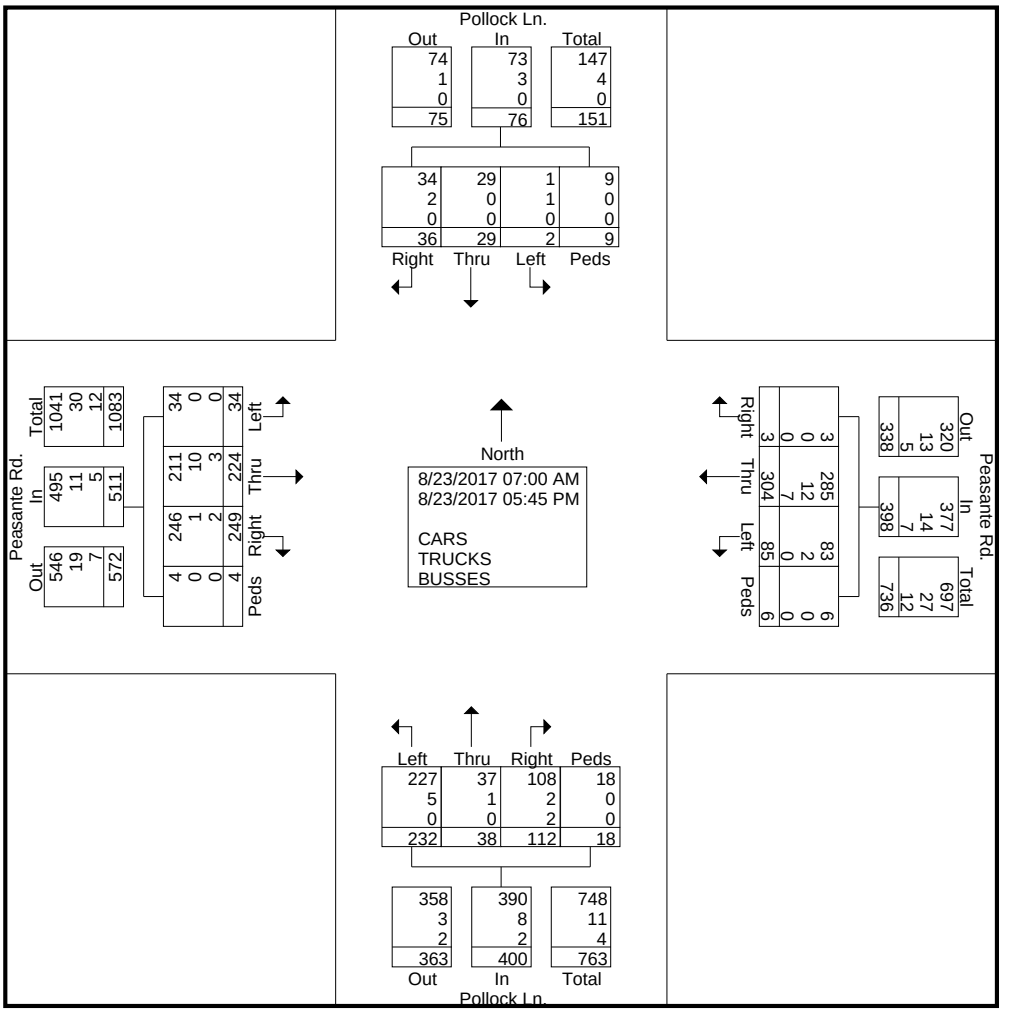
Groups Printed- CARS - TRUCKS - BUSSES

	Pollock Ln. From North					Peasante Rd. From East					Pollock Ln. From South					Peasante Rd. From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	3	1	0	0	4	0	30	6	0	36	1	1	13	1	16	3	5	0	0	8	64
07:15 AM	3	4	0	4	11	0	29	4	3	36	1	1	32	3	37	18	10	0	4	32	116
07:30 AM	5	3	0	3	11	0	26	5	0	31	3	3	43	8	57	24	4	2	0	30	129
07:45 AM	5	2	0	0	7	0	22	7	0	29	2	1	25	0	28	38	6	1	0	45	109
Total	16	10	0	7	33	0	107	22	3	132	7	6	113	12	138	83	25	3	4	115	418
08:00 AM	1	1	0	0	2	0	17	2	0	19	1	1	13	0	15	18	4	4	0	26	62
08:15 AM	1	0	0	0	1	0	10	5	0	15	2	0	8	0	10	7	4	0	0	11	37
08:30 AM	0	1	0	0	1	0	7	4	0	11	2	0	1	0	3	9	2	1	0	12	27
08:45 AM	0	1	0	0	1	0	11	3	0	14	0	1	3	0	4	10	6	0	0	16	35
Total	2	3	0	0	5	0	45	14	0	59	5	2	25	0	32	44	16	5	0	65	161
*** BREAK ***																					
02:00 PM	0	1	0	0	1	0	9	2	0	11	6	0	5	0	11	4	6	3	0	13	36
02:15 PM	1	1	0	0	2	0	7	2	0	9	2	1	4	0	7	3	6	1	0	10	28
02:30 PM	2	1	0	0	3	0	4	5	0	9	2	2	1	0	5	5	6	1	0	12	29
02:45 PM	1	0	0	0	1	0	12	4	0	16	6	0	7	0	13	6	8	2	0	16	46
Total	4	3	0	0	7	0	32	13	0	45	16	3	17	0	36	18	26	7	0	51	139
03:00 PM	2	2	0	0	4	1	8	5	0	14	7	1	14	0	22	9	10	4	0	23	63
03:15 PM	1	0	0	0	1	0	11	3	0	14	2	1	3	0	6	6	12	0	0	18	39
03:30 PM	1	1	0	0	2	0	13	1	0	14	9	2	7	0	18	7	11	2	0	20	54
03:45 PM	1	0	0	0	1	0	11	6	0	17	6	0	4	0	10	6	10	1	0	17	45
Total	5	3	0	0	8	1	43	15	0	59	24	4	28	0	56	28	43	7	0	78	201
04:00 PM	0	0	0	1	1	0	7	5	0	12	5	5	6	6	22	7	13	1	0	21	56
04:15 PM	0	0	0	0	0	1	10	1	1	13	8	3	6	0	17	13	11	0	0	24	54
04:30 PM	2	1	0	0	3	0	11	2	0	13	4	3	6	0	13	7	12	1	0	20	49
04:45 PM	4	1	1	0	6	0	10	3	0	13	9	0	8	0	17	15	27	1	0	43	79
Total	6	2	1	1	10	1	38	11	1	51	26	11	26	6	69	42	63	3	0	108	238
05:00 PM	0	0	0	0	0	0	11	3	0	14	10	3	6	0	19	14	11	3	0	28	61
05:15 PM	2	1	1	1	5	1	6	4	0	11	9	4	5	0	18	6	13	1	0	20	54
05:30 PM	1	6	0	0	7	0	13	1	0	14	5	2	7	0	14	9	14	3	0	26	61
05:45 PM	0	1	0	0	1	0	9	2	2	13	10	3	5	0	18	5	13	2	0	20	52
Total	3	8	1	1	13	1	39	10	2	52	34	12	23	0	69	34	51	9	0	94	228
Grand Total	36	29	2	9	76	3	304	85	6	398	112	38	232	18	400	249	224	34	4	511	1385
Apprch %	47.4	38.2	2.6	11.8		0.8	76.4	21.4	1.5		28	9.5	58	4.5		48.7	43.8	6.7	0.8		
Total %	2.6	2.1	0.1	0.6	5.5	0.2	21.9	6.1	0.4	28.7	8.1	2.7	16.8	1.3	28.9	18	16.2	2.5	0.3	36.9	
CARS	34	29	1	9	73	3	285	83	6	377	108	37	227	18	390	246	211	34	4	495	1335
% CARS	94.4	100	50	100	96.1	100	93.8	97.6	100	94.7	96.4	97.4	97.8	100	97.5	98.8	94.2	100	100	96.9	96.4
TRUCKS	2	0	1	0	3	0	12	2	0	14	2	1	5	0	8	1	10	0	0	11	36
% TRUCKS	5.6	0	50	0	3.9	0	3.9	2.4	0	3.5	1.8	2.6	2.2	0	2	0.4	4.5	0	0	2.2	2.6
BUSSES	0	0	0	0	0	0	7	0	0	7	2	0	0	0	2	2	3	0	0	5	14
% BUSSES	0	0	0	0	0	0	2.3	0	0	1.8	1.8	0	0	0	0.5	0.8	1.3	0	0	1	1

Mott MacDonald

1300-B First Street
Gilroy, CA 95020

File Name : 383280ako1-cars
Site Code : 00000000
Start Date : 8/23/2017
Page No : 2



	Pollock Ln. From North					Peasante Rd. From East					Pollock Ln. From South					Peasante Rd. From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	3	1	0	0	4	0	**30**	6	0	**36**	1	1	13	1	16	3	5	0	0	8	64
07:15 AM	3	**4**	0	**4**	**11**	0	29	4	**3**	36	1	1	32	3	37	18	**10**	0	**4**	32	116
07:30 AM	**5**	3	0	3	11	0	26	5	0	31	**3**	**3**	**43**	**8**	**57**	24	4	**2**	0	30	**129**
07:45 AM	5	2	0	0	7	0	22	**7**	0	29	2	1	25	0	28	**38**	6	1	0	**45**	109
Total Volume	16	10	0	7	33	0	107	22	3	132	7	6	113	12	138	83	25	3	4	115	418
% App. Total	48.5	30.3	0	21.2		0	81.1	16.7	2.3		5.1	4.3	81.9	8.7		72.2	21.7	2.6	3.5		
PHF	.800	.625	.000	.438	.750	.000	.892	.786	.250	.917	.583	.500	.657	.375	.605	.546	.625	.375	.250	.639	.810

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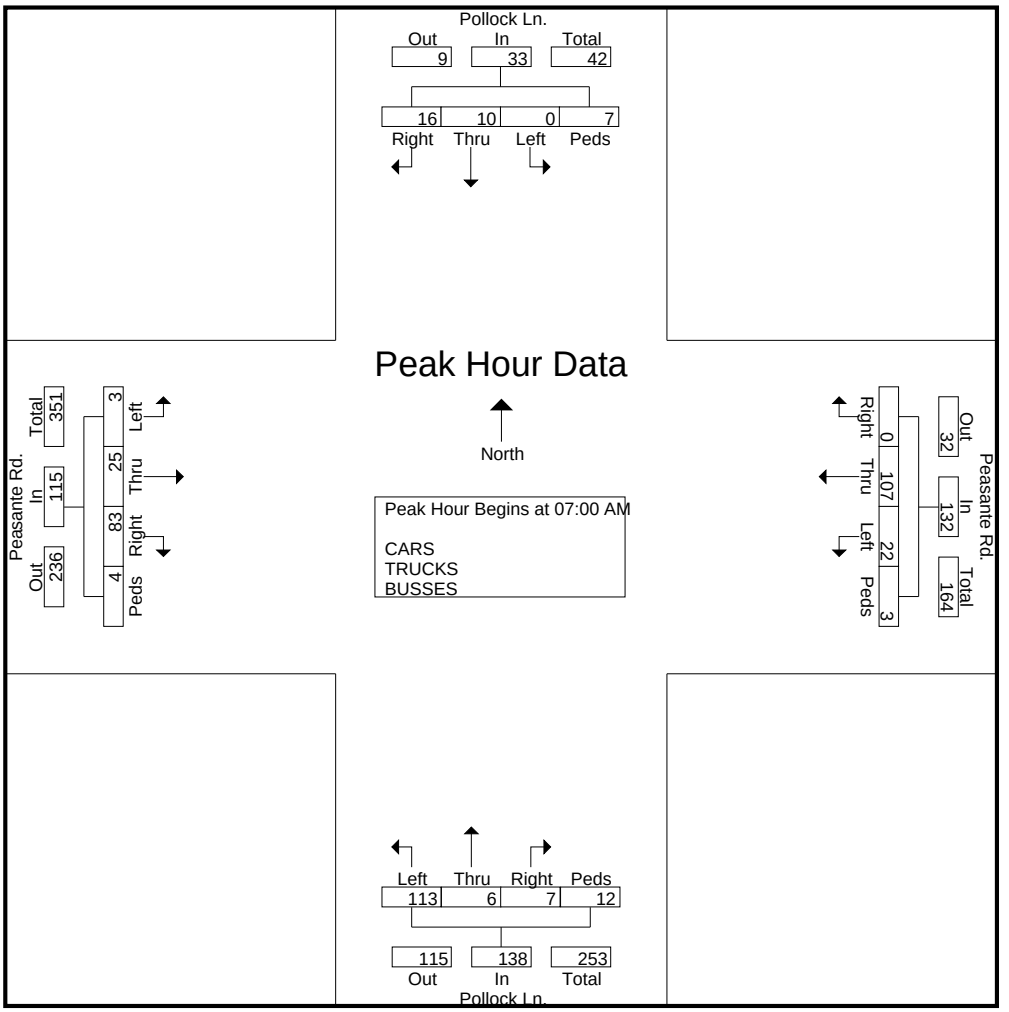
1300-B First Street
Gilroy, CA 95020

File Name : 383280ako1-cars
Site Code : 00000000
Start Date : 8/23/2017
Page No : 3



Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 02:45 PM

02:45 PM	1	0	0	0	1	0	12	4	0	**16**	6	0	7	0	13	6	8	2	0	16	46
03:00 PM	**2**	**2**	0	0	**4**	**1**	8	**5**	0	14	7	1	**14**	0	**22**	**9**	10	**4**	0	**23**	**63**
03:15 PM	1	0	0	0	1	0	11	3	0	14	2	1	3	0	6	6	**12**	0	0	18	39
03:30 PM	1	1	0	0	2	0	**13**	1	0	14	**9**	**2**	7	0	18	7	11	2	0	20	54
Total Volume	5	3	0	0	8	1	44	13	0	58	24	4	31	0	59	28	41	8	0	77	202
% App. Total	62.5	37.5	0	0		1.7	75.9	22.4	0		40.7	6.8	52.5	0		36.4	53.2	10.4	0		
PHF	.625	.375	.000	.000	.500	.250	.846	.650	.000	.906	.667	.500	.554	.000	.670	.778	.854	.500	.000	.837	.802

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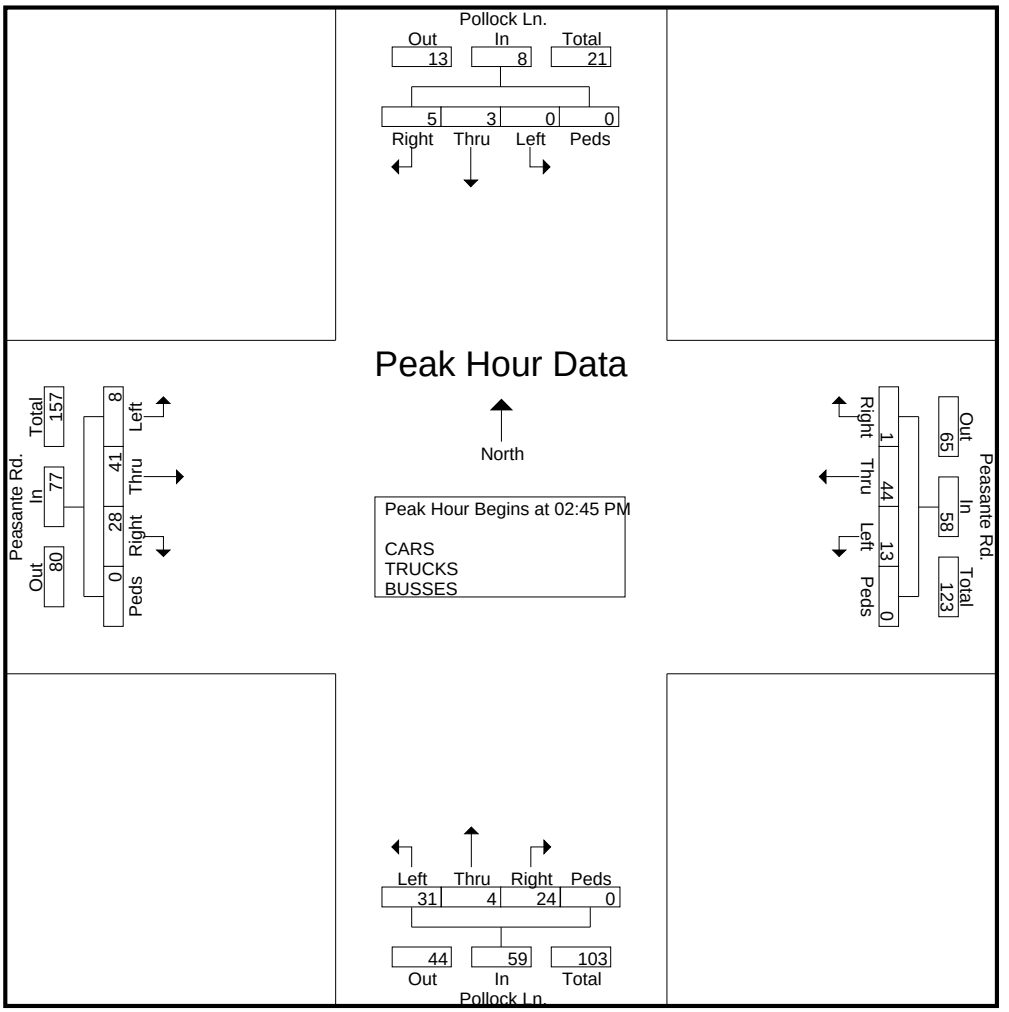
File Name : 383280ako1-cars
Site Code : 00000000
Start Date : 8/23/2017
Page No : 4



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:45 PM

04:45 PM	**4**	1	**1**	0	6	0	10	3	0	13	9	0	**8**	0	17	**15**	**27**	1	0	**43**	**79**
05:00 PM	0	0	0	0	0	0	11	3	0	**14**	**10**	3	6	0	**19**	14	11	**3**	0	28	61
05:15 PM	2	1	1	**1**	5	**1**	6	**4**	0	11	9	**4**	5	0	18	6	13	1	0	20	54
05:30 PM	1	**6**	0	0	**7**	0	**13**	1	0	14	5	2	7	0	14	9	14	3	0	26	61
Total Volume	7	8	2	1	18	1	40	11	0	52	33	9	26	0	68	44	65	8	0	117	255
% App. Total	38.9	44.4	11.1	5.6		1.9	76.9	21.2	0		48.5	13.2	38.2	0		37.6	55.6	6.8	0		
PHF	.438	.333	.500	.250	.643	.250	.769	.688	.000	.929	.825	.563	.813	.000	.895	.733	.602	.667	.000	.680	.807

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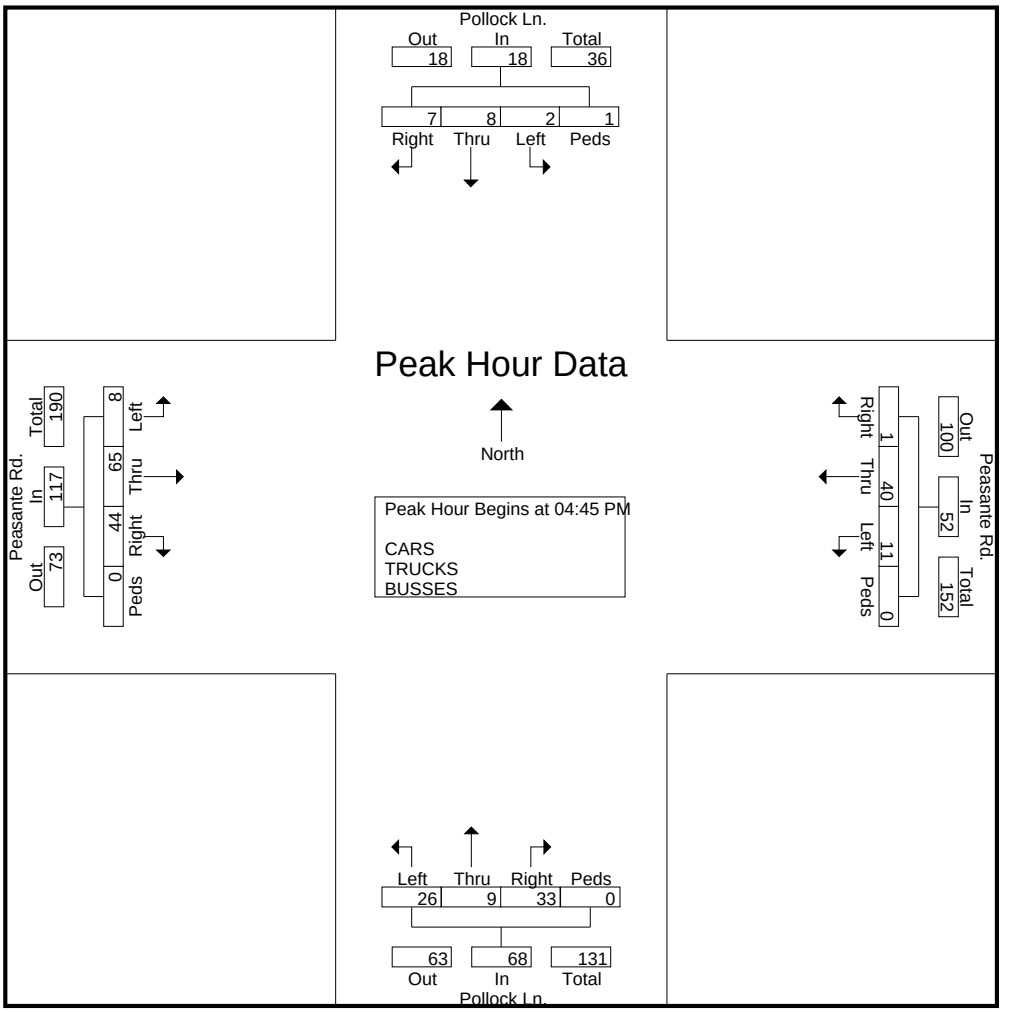
1300-B First Street
Gilroy, CA 95020

File Name : 383280ako1-cars
Site Code : 00000000
Start Date : 8/23/2017
Page No : 5

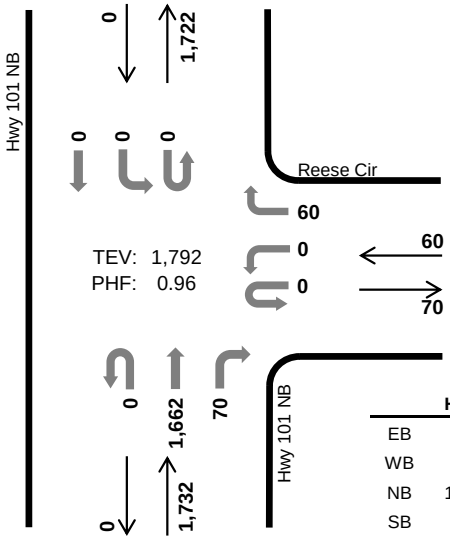


Hwy 101 NB
Reese Cir

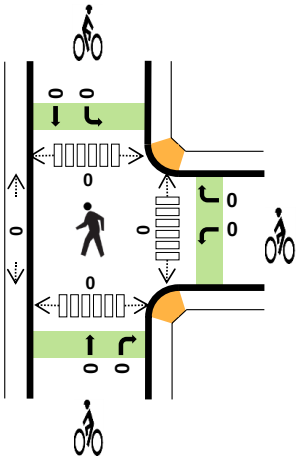
Date: 06/23/2016
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:00 AM to 8:00 AM

N

Peak Hour



	HV %:	PHF
EB	-	-
WB	1.7%	0.88
NB	10.2%	0.96
SB	-	-
TOTAL	9.9%	0.96



Two-Hour Count Summaries

Interval Start	0 Eastbound				Reese Cir Westbound				Hwy 101 NB Northbound				Hwy 101 NB Southbound				15-min Total	Rolling One Hour
	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**	**0**	**15**	**0**	**0**	**379**	**21**	**0**	**0**	**0**	**0**	**415**	0
7:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**424**	**17**	**0**	**0**	**0**	**0**	**453**	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**16**	**0**	**0**	**438**	**11**	**0**	**0**	**0**	**0**	**465**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**17**	**0**	**0**	**421**	**21**	**0**	**0**	**0**	**0**	**459**	**1,792**
8:00 AM	0	0	0	0	0	0	0	10	0	0	380	14	0	0	0	0	404	1,781
8:15 AM	0	0	0	0	0	0	0	21	0	0	378	12	0	0	0	0	411	1,739
8:30 AM	0	0	0	0	0	0	0	12	0	0	372	17	0	0	0	0	401	1,675
8:45 AM	0	0	0	0	0	0	0	14	0	0	398	22	0	0	0	0	434	1,650
Count Total	0	0	0	0	0	0	0	117	0	0	3,190	135	0	0	0	0	3,442	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**60**	**0**	**0**	**1,662**	**70**	**0**	**0**	**0**	**0**	**1,792**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**171**	**6**	**0**	**0**	**0**	**0**	**178**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2%**	**-**	**-**	**10%**	**9%**	**-**	**-**	**-**	**-**	**10%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

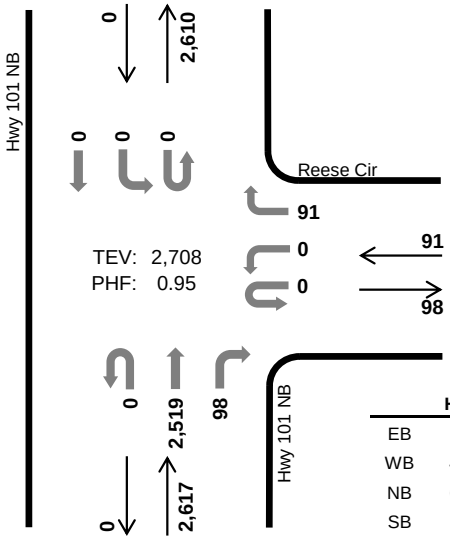
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	**0**	**0**	**37**	**0**	***37***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:15 AM	**0**	**0**	**51**	**0**	***51***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**0**	**1**	**43**	**0**	***44***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**0**	**46**	**0**	***46***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	0	3	53	0	*56*	0	0	0	0	*0*	0	0	0	0	*0*
8:15 AM	0	5	52	0	*57*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	0	2	49	0	*51*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	1	66	0	*67*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	12	397	0	*409*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**1**	**177**	**0**	***178***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Hwy 101 NB
Reese Cir

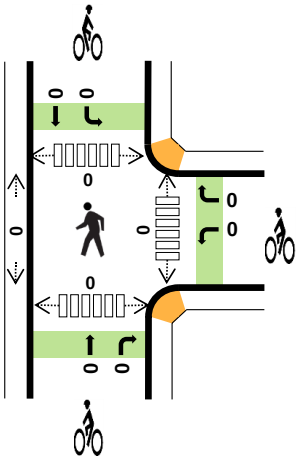
Date: 06/23/2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

N

Peak Hour



	HV %:	PHF
EB	-	-
WB	4.4%	0.84
NB	6.4%	0.95
SB	-	-
TOTAL	6.3%	0.95



Two-Hour Count Summaries

Interval Start	0 Eastbound				Reese Cir Westbound				Hwy 101 NB Northbound				Hwy 101 NB Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	19	0	0	542	19	0	0	0	0	580	0
4:15 PM	0	0	0	0	0	0	0	17	0	0	624	18	0	0	0	0	659	0
4:30 PM	0	0	0	0	0	0	0	18	0	0	583	11	0	0	0	0	612	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**25**	**0**	**0**	**588**	**31**	**0**	**0**	**0**	**0**	**644**	2,495
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**0**	**0**	**607**	**22**	**0**	**0**	**0**	**0**	**647**	2,562
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**0**	**0**	**659**	**21**	**0**	**0**	**0**	**0**	**701**	2,604
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**27**	**0**	**0**	**665**	**24**	**0**	**0**	**0**	**0**	**716**	**2,708**
5:45 PM	0	0	0	0	0	0	0	13	0	0	558	20	0	0	0	0	591	2,655
Count Total	0	0	0	0	0	0	0	158	0	0	4,826	166	0	0	0	0	5,150	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**91**	**0**	**0**	**2,519**	**98**	**0**	**0**	**0**	**0**	**2,708**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**163**	**4**	**0**	**0**	**0**	**0**	**171**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4%**	**-**	**-**	**6%**	**4%**	**-**	**-**	**-**	**-**	**6%**	**0**

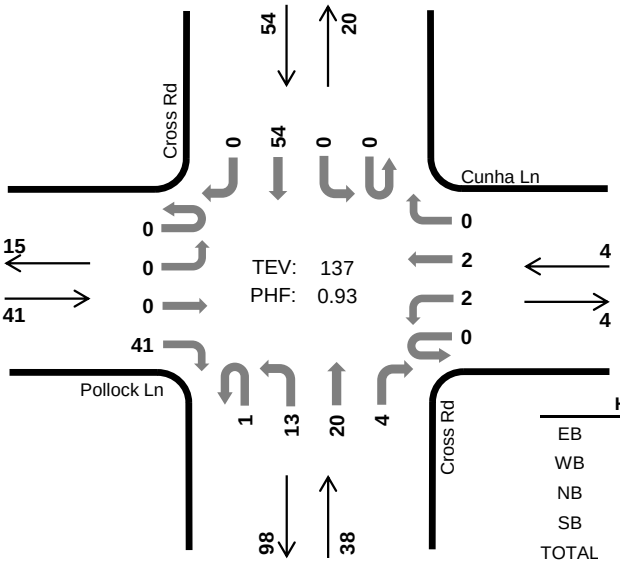
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

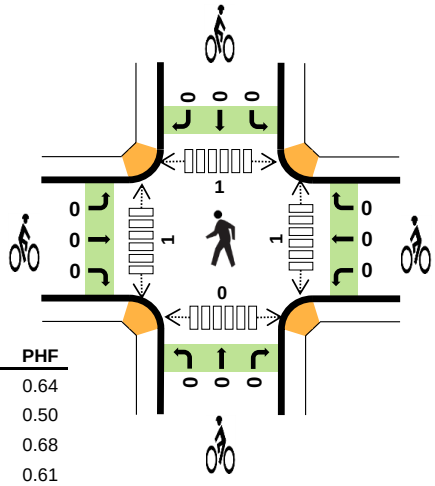
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	2	32	0	*34*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	0	0	70	0	*70*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	0	40	0	*40*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	**0**	**3**	**44**	**0**	***47***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**0**	**0**	**39**	**0**	***39***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**0**	**0**	**48**	**0**	***48***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:30 PM	**0**	**1**	**36**	**0**	***37***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:45 PM	0	0	42	0	*42*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	6	351	0	*357*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**4**	**167**	**0**	***171***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Cross Rd
Pollock Ln

Peak Hour

Date: 06/23/2016
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM





	HV %:	PHF
EB	0.0%	0.64
WB	0.0%	0.50
NB	7.9%	0.68
SB	0.0%	0.61
TOTAL	2.2%	0.93

Two-Hour Count Summaries

Interval Start		Pollock Ln Eastbound				Cunha Ln Westbound				Cross Rd Northbound				Cross Rd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	9	0	1	0	0	0	0	5	1	0	0	9	0	25	0
7:15 AM		**0**	**0**	**0**	**16**	**0**	**1**	**0**	**0**	**0**	**3**	**6**	**0**	**0**	**0**	**10**	**0**	**36**	0
7:30 AM		**0**	**0**	**0**	**8**	**0**	**1**	**0**	**0**	**0**	**2**	**2**	**2**	**0**	**0**	**22**	**0**	**37**	0
7:45 AM		**0**	**0**	**0**	**9**	**0**	**0**	**2**	**0**	**1**	**2**	**5**	**1**	**0**	**0**	**14**	**0**	**34**	132
8:00 AM		**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**6**	**7**	**1**	**0**	**0**	**8**	**0**	**30**	**137**
8:15 AM		0	0	0	9	0	0	0	0	0	3	1	0	0	0	8	0	21	122
8:30 AM		0	0	0	8	0	0	0	0	0	2	8	0	0	0	3	0	21	106
8:45 AM		0	0	0	10	0	0	0	0	0	2	5	0	0	0	7	0	24	96
Count Total		0	0	0	77	0	3	2	0	1	20	39	5	0	0	81	0	228	0
Peak Hour	**All**	**0**	**0**	**0**	**41**	**0**	**2**	**2**	**0**	**1**	**13**	**20**	**4**	**0**	**0**	**54**	**0**	**137**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**0**
	HV%	**-**	**-**	**-**	**0%**	**-**	**0%**	**0%**	**-**	**0%**	**15%**	**5%**	**0%**	**-**	**-**	**0%**	**-**	**2%**	**0**

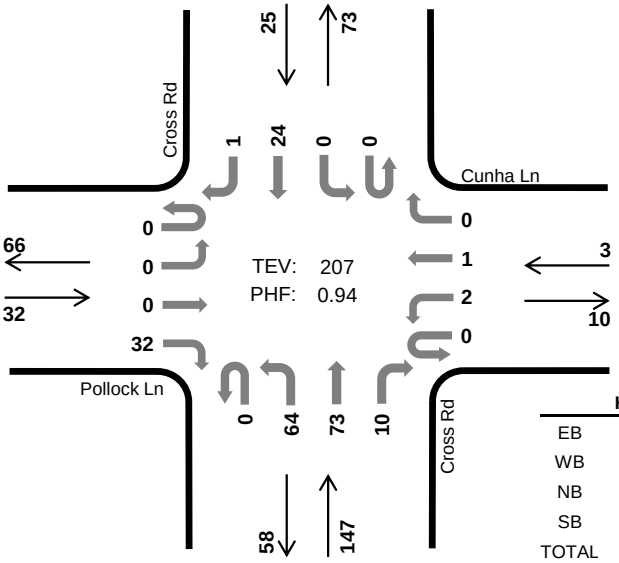
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

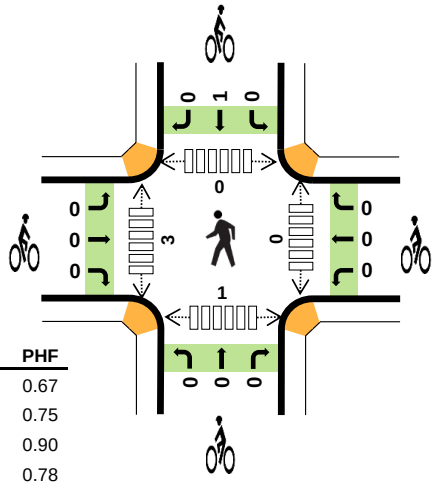
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
7:45 AM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**1**	**0**	*2*
8:00 AM	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	0	0	0	1	*1*	0	0	0	0	*0*	1	0	1	0	*2*
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	0	0	3	1	*4*	0	0	0	0	*0*	2	1	2	0	*5*
Peak Hour	**0**	**0**	**3**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**1**	**0**	***3***

Cross Rd
Pollock Ln

Peak Hour

Date: 06/23/2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	0.0%	0.67
WB	0.0%	0.75
NB	1.4%	0.90
SB	0.0%	0.78
TOTAL	1.0%	0.94

Two-Hour Count Summaries

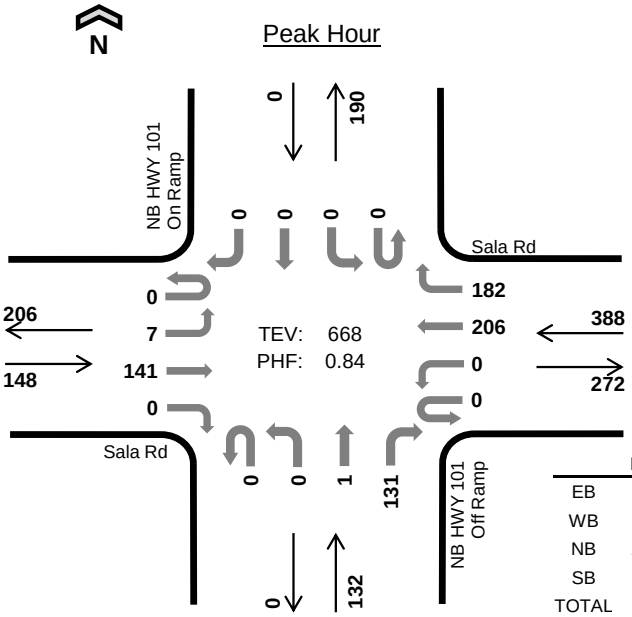
Interval Start	Pollock Ln Eastbound				Cunha Ln Westbound				Cross Rd Northbound				Cross Rd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	6	0	2	1	0	0	14	9	0	0	0	10	0	42	0
4:15 PM	1	0	0	6	0	4	0	0	0	8	17	2	0	0	3	0	41	0
4:30 PM	0	1	0	8	0	1	0	0	0	14	14	0	0	0	7	0	45	0
4:45 PM	**0**	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**0**	**17**	**20**	**4**	**0**	**0**	**8**	**0**	**54**	182
5:00 PM	**0**	**0**	**0**	**8**	**0**	**1**	**0**	**0**	**0**	**17**	**18**	**3**	**0**	**0**	**8**	**0**	**55**	195
5:15 PM	**0**	**0**	**0**	**12**	**0**	**1**	**0**	**0**	**0**	**14**	**15**	**1**	**0**	**0**	**4**	**0**	**47**	201
5:30 PM	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**16**	**20**	**2**	**0**	**0**	**4**	**1**	**51**	**207**
5:45 PM	0	0	0	6	0	0	0	0	0	12	23	1	0	0	6	0	48	201
Count Total	1	1	0	58	0	9	2	0	0	112	136	13	0	0	50	1	383	0
Peak Hour All	**0**	**0**	**0**	**32**	**0**	**2**	**1**	**0**	**0**	**64**	**73**	**10**	**0**	**0**	**24**	**1**	**207**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**0**
Peak Hour HV%	**-**	**-**	**-**	**0%**	**-**	**0%**	**0%**	**-**	**-**	**0%**	**3%**	**0%**	**-**	**-**	**0%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

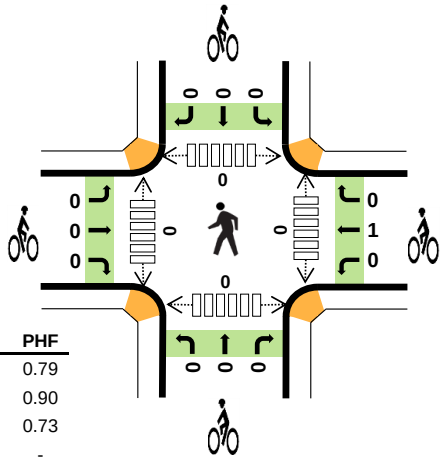
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	0	0	*1*
4:15 PM	0	0	2	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**1**	*1*
5:00 PM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**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**	**0**	**0**	**0**	***0***	**0**	**3**	**0**	**0**	***3***
5:45 PM	0	0	1	1	*2*	0	0	0	0	*0*	0	0	0	3	*3*
Count Total	0	0	5	1	*6*	0	0	0	1	*1*	0	4	0	4	*8*
Peak Hour	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**1**	***1***	**0**	**3**	**0**	**1**	***4***

NB HWY 101 Off Ramp
Sala Rd

Date: 05/31/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM



	HV %:	PHF
EB	6.1%	0.79
WB	4.9%	0.90
NB	12.1%	0.73
SB	-	-
TOTAL	6.6%	0.84



Two-Hour Count Summaries

Interval Start	Sala Rd Eastbound				Sala Rd Westbound				NB HWY 101 Off Ramp Northbound				NB HWY 101 On Ramp Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	15	0	0	0	22	52	0	2	1	18	0	0	0	0	111	0
7:15 AM	**0**	**1**	**23**	**0**	**0**	**0**	**43**	**44**	**0**	**0**	**0**	**25**	**0**	**0**	**0**	**0**	**136**	0
7:30 AM	**0**	**4**	**43**	**0**	**0**	**0**	**59**	**48**	**0**	**0**	**0**	**26**	**0**	**0**	**0**	**0**	**180**	0
7:45 AM	**0**	**1**	**46**	**0**	**0**	**0**	**60**	**48**	**0**	**0**	**1**	**44**	**0**	**0**	**0**	**0**	**200**	627
8:00 AM	**0**	**1**	**29**	**0**	**0**	**0**	**44**	**42**	**0**	**0**	**0**	**36**	**0**	**0**	**0**	**0**	**152**	**668**
8:15 AM	0	1	21	0	0	0	30	31	0	0	0	26	0	0	0	0	109	641
8:30 AM	0	2	18	0	0	0	27	27	0	0	0	35	0	0	0	0	109	570
8:45 AM	0	3	29	0	0	0	18	24	0	2	0	24	0	0	0	0	100	470
Count Total	0	14	224	0	0	0	303	316	0	4	2	234	0	0	0	0	1,097	0
Peak Hour All	**0**	**7**	**141**	**0**	**0**	**0**	**206**	**182**	**0**	**0**	**1**	**131**	**0**	**0**	**0**	**0**	**668**	**0**
Peak Hour HV	**0**	**3**	**6**	**0**	**0**	**0**	**11**	**8**	**0**	**0**	**0**	**16**	**0**	**0**	**0**	**0**	**44**	**0**
Peak Hour HV%	**-**	**43%**	**4%**	**-**	**-**	**-**	**5%**	**4%**	**-**	**-**	**0%**	**12%**	**-**	**-**	**-**	**-**	**7%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

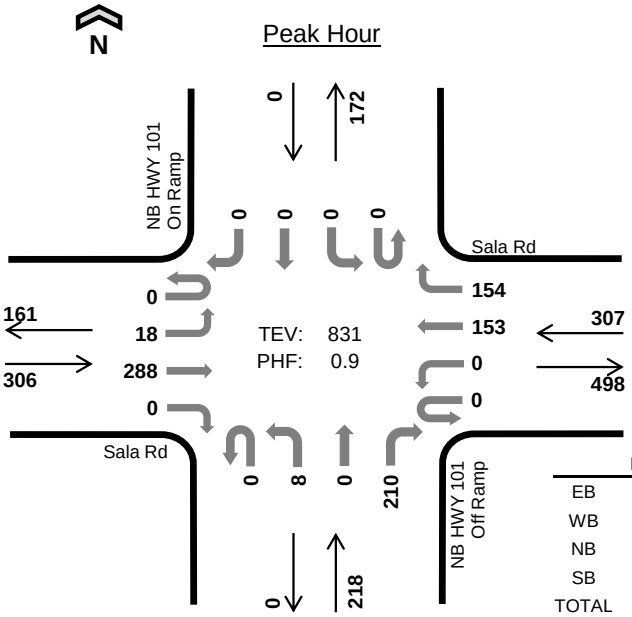
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	5	4	0	*13*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**1**	**4**	**4**	**0**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**1**	**4**	**2**	**0**	***7***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**3**	**4**	**4**	**0**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**4**	**7**	**6**	**0**	***17***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	2	4	5	0	*11*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	3	5	9	0	*17*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	1	5	5	0	*11*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	19	38	39	0	*96*	0	1	0	0	*1*	0	0	0	0	*0*
Peak Hour	**9**	**19**	**16**	**0**	***44***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

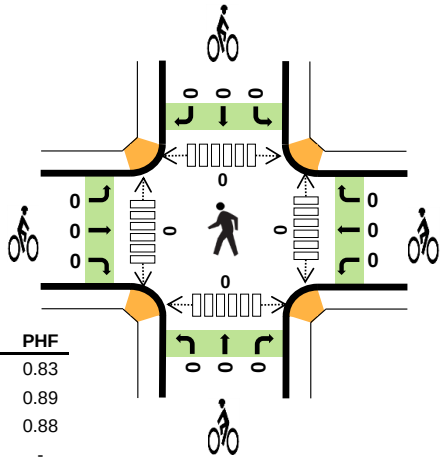
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

NB HWY 101 Off Ramp
Sala Rd

Date: 05/31/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

Peak Hour





	HV %:	PHF
EB	2.6%	0.83
WB	4.9%	0.89
NB	9.2%	0.88
SB	-	-
TOTAL	5.2%	0.90

Two-Hour Count Summaries

Interval Start		Sala Rd Eastbound				Sala Rd Westbound				NB HWY 101 Off Ramp Northbound				NB HWY 101 On Ramp Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	3	47	0	0	0	32	24	0	2	0	50	0	0	0	0	158	0
4:15 PM		0	2	51	0	0	0	34	40	0	1	1	38	0	0	0	0	167	0
4:30 PM		0	8	56	0	0	0	41	39	0	0	1	40	0	0	0	0	185	0
4:45 PM		**0**	**9**	**83**	**0**	**0**	**0**	**45**	**41**	**0**	**1**	**0**	**52**	**0**	**0**	**0**	**0**	**231**	741
5:00 PM		**0**	**5**	**58**	**0**	**0**	**0**	**41**	**40**	**0**	**3**	**0**	**59**	**0**	**0**	**0**	**0**	**206**	789
5:15 PM		**0**	**4**	**72**	**0**	**0**	**0**	**38**	**37**	**0**	**1**	**0**	**53**	**0**	**0**	**0**	**0**	**205**	827
5:30 PM		**0**	**0**	**75**	**0**	**0**	**0**	**29**	**36**	**0**	**3**	**0**	**46**	**0**	**0**	**0**	**0**	**189**	**831**
5:45 PM		0	1	66	0	0	0	36	30	0	1	0	57	0	0	0	0	191	791
Count Total		0	32	508	0	0	0	296	287	0	12	2	395	0	0	0	0	1,532	0
Peak Hour	**All**	**0**	**18**	**288**	**0**	**0**	**0**	**153**	**154**	**0**	**8**	**0**	**210**	**0**	**0**	**0**	**0**	**831**	**0**
	HV	**0**	**0**	**8**	**0**	**0**	**0**	**12**	**3**	**0**	**1**	**0**	**19**	**0**	**0**	**0**	**0**	**43**	**0**
	HV%	**-**	**0%**	**3%**	**-**	**-**	**-**	**8%**	**2%**	**-**	**13%**	**-**	**9%**	**-**	**-**	**-**	**-**	**5%**	**0**

Note: Two-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
4:00 PM	6	4	7	0	*17*	0	0	0	0	*0*	0	0	0	1	*1*
4:15 PM	2	9	7	0	*18*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	2	10	4	0	*16*	0	0	0	0	*0*	0	0	0	0	*0*
4:45 PM	**2**	**5**	**4**	**0**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**1**	**3**	**4**	**0**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**3**	**3**	**5**	**0**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:30 PM	**2**	**4**	**7**	**0**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:45 PM	6	3	2	0	*11*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	24	41	40	0	*105*	0	0	0	0	*0*	0	0	0	1	*1*
Peak Hour	**8**	**15**	**20**	**0**	***43***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

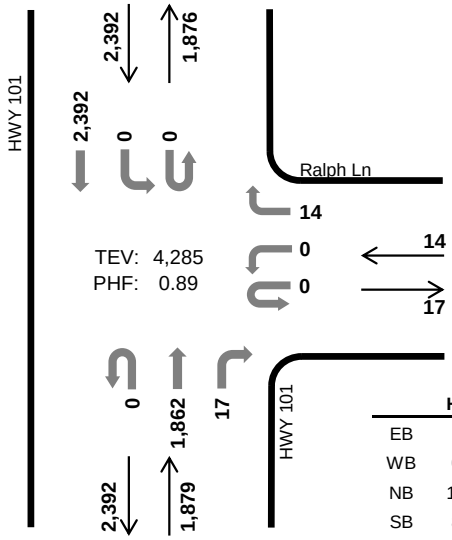
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

HWY 101
Ralph Ln

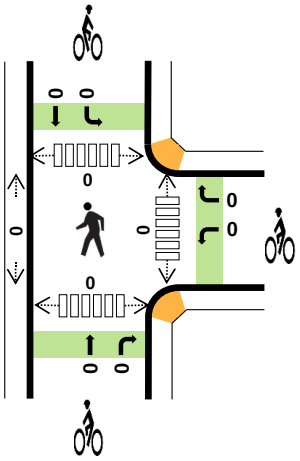
Date: 05/31/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM

N

Peak Hour



	HV %:	PHF
EB	-	-
WB	0.0%	0.58
NB	12.0%	0.93
SB	8.2%	0.86
TOTAL	9.8%	0.89



Two-Hour Count Summaries

Interval Start		0 Eastbound				Ralph Ln Westbound				HWY 101 Northbound				HWY 101 Southbound				15-min Total	Rolling One Hour
		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	0	3	0	0	411	2	0	0	445	0	861	0
7:15 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**486**	**5**	**0**	**0**	**557**	**0**	**1,052**	0
7:30 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**501**	**3**	**0**	**0**	**696**	**0**	**1,206**	0
7:45 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**432**	**7**	**0**	**0**	**641**	**0**	**1,083**	4,202
8:00 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**443**	**2**	**0**	**0**	**498**	**0**	**944**	**4,285**
8:15 AM		0	0	0	0	0	0	0	6	0	0	367	4	0	0	402	0	779	4,012
8:30 AM		0	0	0	0	0	0	0	1	0	0	416	4	0	0	402	0	823	3,629
8:45 AM		0	0	0	0	0	0	0	0	0	0	402	6	0	0	383	0	791	3,337
Count Total		0	0	0	0	0	0	0	24	0	0	3,458	33	0	0	4,024	0	7,539	0
Peak Hour	**All**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**0**	**0**	**1,862**	**17**	**0**	**0**	**2,392**	**0**	**4,285**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**225**	**1**	**0**	**0**	**196**	**0**	**422**	**0**
	HV%	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**-**	**12%**	**6%**	**-**	**-**	**8%**	**-**	**10%**	**0**

Note: Two-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
7:00 AM	0	0	45	46	*91*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**0**	**0**	**51**	**48**	***99***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**0**	**0**	**59**	**49**	***108***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**0**	**58**	**53**	***111***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**0**	**0**	**58**	**46**	***104***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	0	0	58	45	*103*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	0	0	66	65	*131*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	71	39	*110*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	0	466	391	*857*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**0**	**226**	**196**	***422***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

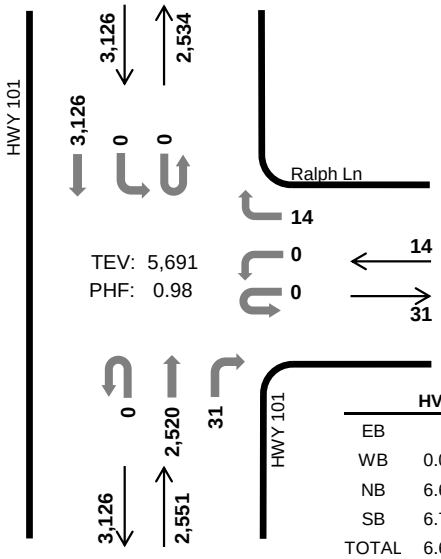
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

HWY 101
Ralph Ln

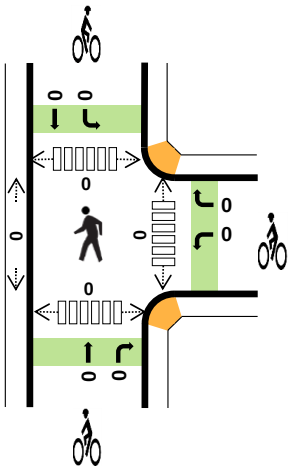
N

Peak Hour

Date: 05/31/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM



	HV %:	PHF
EB	-	-
WB	0.0%	0.70
NB	6.6%	0.96
SB	6.7%	0.93
TOTAL	6.6%	0.98



Two-Hour Count Summaries

Interval Start	0 Eastbound				Ralph Ln Westbound				HWY 101 Northbound				HWY 101 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	1	0	0	567	5	0	0	529	0	1,102	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**602**	**5**	**0**	**0**	**787**	**0**	**1,399**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**608**	**6**	**0**	**0**	**836**	**0**	**1,452**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**652**	**12**	**0**	**0**	**736**	**0**	**1,403**	5,356
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**658**	**8**	**0**	**0**	**767**	**0**	**1,437**	**5,691**
5:15 PM	0	0	0	0	0	0	0	5	0	0	622	12	0	0	666	0	1,305	5,597
5:30 PM	0	0	0	0	0	0	0	2	0	0	567	5	0	0	795	0	1,369	5,514
5:45 PM	0	0	0	0	0	0	0	1	0	0	531	8	0	0	666	0	1,206	5,317
Count Total	0	0	0	0	0	0	0	23	0	0	4,807	61	0	0	5,782	0	10,673	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**0**	**0**	**2,520**	**31**	**0**	**0**	**3,126**	**0**	**5,691**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**169**	**0**	**0**	**0**	**208**	**0**	**377**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**-**	**7%**	**0%**	**-**	**-**	**7%**	**-**	**7%**	**0**

Note: Two-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
4:00 PM	0	1	43	53	*97*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	**0**	**0**	**50**	**62**	***112***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**0**	**0**	**44**	**59**	***103***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**0**	**0**	**37**	**53**	***90***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**0**	**0**	**38**	**34**	***72***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	0	0	27	47	*74*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	0	1	34	58	*93*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	38	43	*81*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	2	311	409	*722*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**0**	**169**	**208**	***377***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

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Appendix C-1

Intersection Level of Service Calculations

Intersection

Int Delay, s/veh 6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	16	1	0	0	1	0	0	0	5	1
Future Vol, veh/h	0	0	16	1	0	0	1	0	0	0	5	1
Conflicting Peds, #/hr	2	0	2	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	21	1	0	0	1	0	0	0	6	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	12	10	9	22	11	2	8	0	0	0	0	0
Stage 1	7	7	-	3	3	-	-	-	-	-	-	-
Stage 2	5	3	-	19	8	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	1005	885	1073	990	884	1082	1612	-	-	-	-	-
Stage 1	1015	890	-	1020	893	-	-	-	-	-	-	-
Stage 2	1017	893	-	1000	889	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	1003	884	1071	969	883	1080	1609	-	-	-	-	-
Mov Cap-2 Maneuver	1003	884	-	969	883	-	-	-	-	-	-	-
Stage 1	1014	890	-	1019	892	-	-	-	-	-	-	-
Stage 2	1014	892	-	979	889	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.4	8.7	7.2	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1609	-	-	1071	969	-	-	-
HCM Lane V/C Ratio	0.001	-	-	0.019	0.001	-	-	-
HCM Control Delay (s)	7.2	0	-	8.4	8.7	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	-	-	-

Intersection

Int Delay, s/veh 4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	5	1	0	31	0	6	0	0	0	0	28
Future Vol, veh/h	3	5	1	0	31	0	6	0	0	0	0	28
Conflicting Peds, #/hr	0	0	3	3	0	0	3	0	3	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	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	40	2	2	6	2	2	2	2	2	2	2
Mvmt Flow	4	6	1	0	37	0	7	0	0	0	0	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	37	0	0	10	0	0	74	54	13	54	54	40
Stage 1	-	-	-	-	-	-	17	17	-	37	37	-
Stage 2	-	-	-	-	-	-	57	37	-	17	17	-
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	1574	-	-	1610	-	-	916	837	1067	944	837	1031
Stage 1	-	-	-	-	-	-	1002	881	-	978	864	-
Stage 2	-	-	-	-	-	-	955	864	-	1002	881	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1570	-	-	1606	-	-	880	832	1062	939	832	1028
Mov Cap-2 Maneuver	-	-	-	-	-	-	880	832	-	939	832	-
Stage 1	-	-	-	-	-	-	996	876	-	975	864	-
Stage 2	-	-	-	-	-	-	922	864	-	996	876	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0	9.1	8.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	880	1570	-	-	1606	-	-	1028
HCM Lane V/C Ratio	0.008	0.002	-	-	-	-	-	0.032
HCM Control Delay (s)	9.1	7.3	0	-	0	-	-	8.6
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	27	5	77	111	18	17
Future Vol, veh/h	27	5	77	111	18	17
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	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	6	99	142	23	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	41	0	378	38
Stage 1	-	-	-	-	38	-
Stage 2	-	-	-	-	340	-
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	-	-	1568	-	624	1034
Stage 1	-	-	-	-	984	-
Stage 2	-	-	-	-	721	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1568	-	581	1034
Mov Cap-2 Maneuver	-	-	-	-	581	-
Stage 1	-	-	-	-	984	-
Stage 2	-	-	-	-	671	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	738	-	-	1568	-
HCM Lane V/C Ratio	0.061	-	-	0.063	-
HCM Control Delay (s)	10.2	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.2	-

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing AM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 4 - Pesante Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1809	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	254	vph
Length of first accel/decel lane	295	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1809	254		vph
Peak-hour factor, PHF	0.89	0.89		
Peak 15-min volume, v15	508	71		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2155	291	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2155 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2446	4700	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2155 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	2446	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.339	
Space mean speed in ramp influence area,	S_R = 57.2	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 57.2	mph

Movement	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL2	NWL	NWR
Lane Configurations												
Traffic Volume (veh/h)	19	53	56	77	9	158	10	21	12	206	40	5
Future Volume (veh/h)	19	53	56	77	9	158	10	21	12	206	40	5
Number	1	16	16	7	4	14	3	8	18	5	5	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99	0.99	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
Adj Sat Flow, veh/h/ln	1727	1810	1810	1810	1863	1900	1792	1808	1900	1776	1776	1900
Adj Flow Rate, veh/h	24	72	72	99	12	203	13	27	15	264	264	6
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	10	5	5	5	2	2	6	4	4	7	7	9
Cap, veh/h	48	194	194	316	16	276	78	50	28	324	324	53
Arrive On Green	0.03	0.13	0.13	0.18	0.18	0.18	0.05	0.05	0.05	0.19	0.19	0.30
Sat Flow, veh/h	1645	1526	1526	1723	89	1508	1707	1094	608	1691	1691	180
Grp Volume(v), veh/h	24	72	72	99	0	215	13	0	42	264	264	57
Grp Sat Flow(s),veh/h/ln	1645	1526	1526	1723	0	1597	1707	0	1701	1691	1691	1713
Q Serve(g_s), s	0.6	1.7	1.7	2.0	0.0	5.1	0.3	0.0	1.0	6.0	6.0	1.0
Cycle Q Clear(g_c), s	0.6	1.7	1.7	2.0	0.0	5.1	0.3	0.0	1.0	6.0	6.0	1.0
Prop In Lane	1.00	1.00	1.00	1.00		0.94	1.00		0.36	1.00	1.00	0.11
Lane Grp Cap(c), veh/h	48	194	194	316	0	293	78	0	78	324	324	508
V/C Ratio(X)	0.50	0.37	0.37	0.31	0.00	0.73	0.17	0.00	0.54	0.82	0.82	0.11
Avail Cap(c_a), veh/h	256	763	763	1083	0	1003	1166	0	1161	1192	1192	1809
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	16.2	16.2	14.3	0.0	15.6	18.6	0.0	18.9	15.7	15.7	10.3
Incr Delay (d2), s/veh	2.9	2.4	2.4	0.2	0.0	1.3	0.4	0.0	2.2	1.9	1.9	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	0.3	0.8	0.8	1.0	0.0	2.4	0.1	0.0	0.5	3.0	3.0	0.5
LnGrp Delay(d),s/veh	22.3	18.6	18.6	14.5	0.0	16.9	18.9	0.0	21.0	17.6	17.6	10.5
LnGrp LOS	C	B	B	B		B	B		C	B	B	B
Approach Vol, veh/h	164				314			55		321	321	
Approach Delay, s/veh	18.7				16.2			20.5		16.3	16.3	
Approach LOS	B				B			C		B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.4	16.8		12.0	12.2	9.9		6.2
Change Period (Y+Rc), s	* 4.2	4.8		* 4.6	4.5	4.8		4.4
Max Green Setting (Gmax), s	* 6.3	42.7		* 25	28.5	20.2		27.6
Max Q Clear Time (g_c+I1), s	2.6	3.0		7.1	8.0	3.7		3.0
Green Ext Time (p_c), s	0.0	1.4		0.5	0.1	1.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.0
HCM 2010 LOS	B

Notes

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing AM
Freeway/Dir of Travel:	US 101 / Southbound
Junction:	Intersection 6 - Blackie Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2325	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	221	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2325	221		vph
Peak-hour factor, PHF	0.83	0.83		
Peak 15-min volume, v15	700	67		v
Trucks and buses	9	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2927	272	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2927 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3199	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2927 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	3199	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 25.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.349	
Space mean speed in ramp influence area,	S_R = 57.0	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 57.0	mph

Intersection						
Int Delay, s/veh	4.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	180	4	125	130	4	93
Future Vol, veh/h	180	4	125	130	4	93
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	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	4	0	9
Mvmt Flow	186	4	129	134	4	96

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	300	196	0	0	263	0
Stage 1	196	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	696	850	-	-	1313	-
Stage 1	842	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	694	850	-	-	1313	-
Mov Cap-2 Maneuver	694	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	922	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	697	1313	-
HCM Lane V/C Ratio	-	-	0.272	0.003	-
HCM Control Delay (s)	-	-	12.1	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0	-

Intersection						
Int Delay, s/veh	4.2					

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	20	95	49	224	160	123
Future Vol, veh/h	20	95	49	224	160	123
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	160	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	7	0	8	3	3	18
Mvmt Flow	21	101	52	238	170	131

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	52	0	-	0	52	55
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.17	-	-	-	6.43	6.38
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.263	-	-	-	3.527	3.462
Pot Cap-1 Maneuver	1522	-	-	-	954	968
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1518	-	-	-	941	966
Mov Cap-2 Maneuver	-	-	-	-	941	-
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	-	-

Approach	NB	SB	NE
HCM Control Delay, s	1.3	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	941	966	1518	-	-	-
HCM Lane V/C Ratio	0.181	0.135	0.014	-	-	-
HCM Control Delay (s)	9.7	9.3	7.4	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.7	0.5	0	-	-	-

Intersection

Int Delay, s/veh 5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	25	83	22	107	0	113	6	7	0	10	16
Future Vol, veh/h	3	25	83	22	107	0	113	6	7	0	10	16
Conflicting Peds, #/hr	10	0	16	15	0	10	16	0	15	10	0	11
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	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	6	1	2	6	2	2	2	4	50	0	6
Mvmt Flow	4	31	102	27	132	0	140	7	9	0	12	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	142	0	0	149	0	0	324	302	113	309	353	158
Stage 1	-	-	-	-	-	-	106	106	-	196	196	-
Stage 2	-	-	-	-	-	-	218	196	-	113	157	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.52	6.24	7.6	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4.018	3.336	3.95	4	3.354
Pot Cap-1 Maneuver	1453	-	-	1432	-	-	629	611	934	560	575	877
Stage 1	-	-	-	-	-	-	900	807	-	707	742	-
Stage 2	-	-	-	-	-	-	784	739	-	788	772	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1434	-	-	1414	-	-	577	584	910	528	549	858
Mov Cap-2 Maneuver	-	-	-	-	-	-	577	584	-	528	549	-
Stage 1	-	-	-	-	-	-	885	794	-	699	720	-
Stage 2	-	-	-	-	-	-	727	717	-	761	759	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.3	13.3	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	589	1434	-	-	1414	-	-	705
HCM Lane V/C Ratio	0.264	0.003	-	-	0.019	-	-	0.046
HCM Control Delay (s)	13.3	7.5	0	-	7.6	0	-	10.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0	-	-	0.1	-	-	0.1

HCS 2010: Freeway Merge and Diverge Segments Release 6.70

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing AM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 10 - Reese Circle
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1882	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	129	vph
Length of first accel/decel lane	740	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	202	vph
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	740	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1882	129	202	vph
Peak-hour factor, PHF	0.96	0.96	0.89	
Peak 15-min volume, v15	490	34	57	v
Trucks and buses	10	2	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.985	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2058	136	230	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2058 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2194	4700	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2058 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	2194	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.289

Space mean speed in ramp influence area, S_R = 58.3 mph

Space mean speed in outer lanes, S = N/A mph

Space mean speed for all vehicles, S = 58.3 mph

Intersection

Int Delay, s/veh 5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	93	35	6	0	77	5	3	2	0	0	0	104
Future Vol, veh/h	93	35	6	0	77	5	3	2	0	0	0	104
Conflicting Peds, #/hr	1	0	1	0	0	0	1	0	0	0	0	1
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	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	15	5	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	100	38	6	0	83	5	3	2	0	0	0	112

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	89	0	0	45	0	0	384	331	42	328	331	87
Stage 1	-	-	-	-	-	-	242	242	-	86	86	-
Stage 2	-	-	-	-	-	-	142	89	-	242	245	-
Critical Hdwy	4.25	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.335	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1428	-	-	1576	-	-	578	592	1034	629	592	977
Stage 1	-	-	-	-	-	-	766	709	-	927	827	-
Stage 2	-	-	-	-	-	-	866	825	-	766	707	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1427	-	-	1576	-	-	483	548	1033	592	548	975
Mov Cap-2 Maneuver	-	-	-	-	-	-	483	548	-	592	548	-
Stage 1	-	-	-	-	-	-	710	657	-	860	826	-
Stage 2	-	-	-	-	-	-	766	824	-	709	656	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.4	0	12.2	9.2
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	507	1427	-	-	1576	-	-	975
HCM Lane V/C Ratio	0.011	0.07	-	-	-	-	-	0.115
HCM Control Delay (s)	12.2	7.7	0	-	0	-	-	9.2
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	0.4

Intersection

Int Delay, s/veh 5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	6	0	0	0	14	2	0	0	4	0
Future Vol, veh/h	0	0	6	0	0	0	14	2	0	0	4	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	17	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	6	0	0	0	15	2	0	0	4	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	36	36	4	40	36	2	4	0	0	2	0	0
Stage 1	4	4	-	32	32	-	-	-	-	-	-	-
Stage 2	32	32	-	8	4	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.37	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.453	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	970	856	1037	964	856	1082	1618	-	-	1620	-	-
Stage 1	1018	892	-	984	868	-	-	-	-	-	-	-
Stage 2	984	868	-	1013	892	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	963	848	1037	951	848	1082	1618	-	-	1620	-	-
Mov Cap-2 Maneuver	963	848	-	951	848	-	-	-	-	-	-	-
Stage 1	1009	892	-	975	860	-	-	-	-	-	-	-
Stage 2	975	860	-	1007	892	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	0	6.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1618	-	-	1037	-	1620	-	-
HCM Lane V/C Ratio	0.009	-	-	0.006	-	-	-	-
HCM Control Delay (s)	7.2	0	-	8.5	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	27	6	0	15	1	2	0	0	0	0	10
Future Vol, veh/h	16	27	6	0	15	1	2	0	0	0	0	10
Conflicting Peds, #/hr	1	0	1	0	0	0	1	0	0	0	0	1
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	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	11	2	2	7	2	2	2	2	2	2	2
Mvmt Flow	18	31	7	0	17	1	2	0	0	0	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	19	0	0	39	0	0	95	90	35	89	94	20
Stage 1	-	-	-	-	-	-	71	71	-	19	19	-
Stage 2	-	-	-	-	-	-	24	19	-	70	75	-
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	1597	-	-	1571	-	-	888	800	1038	896	796	1058
Stage 1	-	-	-	-	-	-	939	836	-	1000	880	-
Stage 2	-	-	-	-	-	-	994	880	-	940	833	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1596	-	-	1571	-	-	869	789	1037	887	785	1056
Mov Cap-2 Maneuver	-	-	-	-	-	-	869	789	-	887	785	-
Stage 1	-	-	-	-	-	-	927	825	-	987	879	-
Stage 2	-	-	-	-	-	-	982	879	-	929	822	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0	9.2	8.4
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	869	1596	-	-	1571	-	-	1056
HCM Lane V/C Ratio	0.003	0.011	-	-	-	-	-	0.011
HCM Control Delay (s)	9.2	7.3	0	-	0	-	-	8.4
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	98	2	25	46	6	80
Future Vol, veh/h	98	2	25	46	6	80
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	3
Mvmt Flow	107	2	27	50	7	87

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	109	0	212	108
Stage 1	-	-	-	-	108	-
Stage 2	-	-	-	-	104	-
Critical Hdwy	-	-	4.12	-	6.42	6.23
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.327
Pot Cap-1 Maneuver	-	-	1481	-	776	943
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	920	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1481	-	761	943
Mov Cap-2 Maneuver	-	-	-	-	761	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	903	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	928	-	-	1481	-
HCM Lane V/C Ratio	0.101	-	-	0.018	-
HCM Control Delay (s)	9.3	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing PM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 4 - Pesante Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2589	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	89	vph
Length of first accel/decel lane	295	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2589	89		vph
Peak-hour factor, PHF	0.98	0.98		
Peak 15-min volume, v15	660	23		v
Trucks and buses	9	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2761	93	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2761 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2854	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2761 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	2854	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 25.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.362	
Space mean speed in ramp influence area,	S_R = 56.7	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 56.7	mph

Movement	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL2	NWL	NWR
Lane Configurations												
Traffic Volume (veh/h)	50	126	74	60	21	51	9	23	9	157	31	16
Future Volume (veh/h)	50	126	74	60	21	51	9	23	9	157	31	16
Number	1	16	16	7	4	14	3	8	18	5	5	12
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	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
Adj Sat Flow, veh/h/ln	1845	1845	1845	1827	1900	1900	1900	1889	1900	1810	1810	1900
Adj Flow Rate, veh/h	54	80	80	65	23	55	10	25	10	169	169	17
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	4	0	0	0	0	0	5	5	8
Cap, veh/h	103	265	265	190	54	130	74	52	21	243	243	151
Arrive On Green	0.06	0.17	0.17	0.11	0.11	0.11	0.04	0.04	0.04	0.14	0.14	0.26
Sat Flow, veh/h	1757	1568	1568	1740	498	1191	1810	1285	514	1723	1723	579
Grp Volume(v), veh/h	54	80	80	65	0	78	10	0	35	169	169	50
Grp Sat Flow(s),veh/h/ln	1757	1568	1568	1740	0	1690	1810	0	1799	1723	1723	1703
Q Serve(g_s), s	1.0	1.5	1.5	1.2	0.0	1.5	0.2	0.0	0.6	3.2	3.2	0.8
Cycle Q Clear(g_c), s	1.0	1.5	1.5	1.2	0.0	1.5	0.2	0.0	0.6	3.2	3.2	0.8
Prop In Lane	1.00	1.00	1.00	1.00		0.71	1.00		0.29	1.00	1.00	0.34
Lane Grp Cap(c), veh/h	103	265	265	190	0	184	74	0	73	243	243	443
V/C Ratio(X)	0.52	0.30	0.30	0.34	0.00	0.42	0.14	0.00	0.48	0.70	0.70	0.11
Avail Cap(c_a), veh/h	327	935	935	1304	0	1267	1474	0	1465	1450	1450	2146
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	12.3	12.3	14.0	0.0	14.1	15.7	0.0	15.9	13.9	13.9	9.6
Incr Delay (d2), s/veh	1.5	1.3	1.3	0.4	0.0	0.6	0.3	0.0	1.8	1.3	1.3	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	0.5	0.7	0.7	0.6	0.0	0.7	0.1	0.0	0.3	1.6	1.6	0.4
LnGrp Delay(d),s/veh	17.0	13.6	13.6	14.4	0.0	14.7	16.0	0.0	17.7	15.2	15.2	9.8
LnGrp LOS	B	B	B	B		B	B		B	B	B	A
Approach Vol, veh/h	269				143			45		219	219	
Approach Delay, s/veh	14.8				14.5			17.3		14.0	14.0	
Approach LOS	B				B			B		B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	13.6		8.3	9.3	10.5		5.8
Change Period (Y+Rc), s	* 4.2	4.8		* 4.6	4.5	4.8		4.4
Max Green Setting (Gmax), s	* 6.3	42.7		* 25	28.5	20.2		27.6
Max Q Clear Time (g_c+I1), s	3.0	2.8		3.5	5.2	4.2		2.6
Green Ext Time (p_c), s	0.0	2.0		0.2	0.1	1.5		0.0

Intersection Summary			
HCM 2010 Ctrl Delay		14.6	
HCM 2010 LOS		B	

Notes

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing PM
Freeway/Dir of Travel:	US 101 / Southbound
Junction:	Intersection 6 - Blackie Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2940	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	186	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2940	186		vph
Peak-hour factor, PHF	0.96	0.96		
Peak 15-min volume, v15	766	48		v
Trucks and buses	7	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.966	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3170	198	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3170 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3368	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3170 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	3368	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 27.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M_S = 0.367

Space mean speed in ramp influence area, S_R = 56.6 mph

Space mean speed in outer lanes, S = N/A mph

Space mean speed for all vehicles, S = 56.6 mph

Intersection						
Int Delay, s/veh	2.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	59	5	98	147	21	78
Future Vol, veh/h	59	5	98	147	21	78
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	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	1	0	4
Mvmt Flow	64	5	107	160	23	85

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	316	186	0	0	266	0
Stage 1	186	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	7.1	6.2	-	-	4.1	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	641	861	-	-	1310	-
Stage 1	820	-	-	-	-	-
Stage 2	878	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	632	861	-	-	1310	-
Mov Cap-2 Maneuver	632	-	-	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	862	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	645	1310	-
HCM Lane V/C Ratio	-	-	0.108	0.017	-
HCM Control Delay (s)	-	-	11.3	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	5.8

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	19	33	24	113	212	42
Future Vol, veh/h	19	33	24	113	212	42
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	-	-	160	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	3	2	6
Mvmt Flow	21	36	26	123	230	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	26	0	-	0	26	26
Stage 1	-	-	-	-	26	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.1	-	-	-	6.42	6.26
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.354
Pot Cap-1 Maneuver	1601	-	-	-	989	1038
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1601	-	-	-	976	1038
Mov Cap-2 Maneuver	-	-	-	-	976	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	-	-

Approach	NB	SB	NE
HCM Control Delay, s	2.7	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	976	1038	1601	-	-	-
HCM Lane V/C Ratio	0.236	0.044	0.013	-	-	-
HCM Control Delay (s)	9.8	8.6	7.3	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.9	0.1	0	-	-	-

Intersection

Int Delay, s/veh 3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	65	44	11	40	1	26	9	33	2	8	7
Future Vol, veh/h	8	65	44	11	40	1	26	9	33	2	8	7
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	1	0	1
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	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	6	1	2	6	2	2	2	4	50	0	6
Mvmt Flow	10	80	54	14	49	1	32	11	41	2	10	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	52	0	0	135	0	0	214	206	108	232	232	52
Stage 1	-	-	-	-	-	-	127	127	-	78	78	-
Stage 2	-	-	-	-	-	-	87	79	-	154	154	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.52	6.24	7.6	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4.018	3.336	3.95	4	3.354
Pot Cap-1 Maneuver	1567	-	-	1449	-	-	743	691	940	633	672	1004
Stage 1	-	-	-	-	-	-	877	791	-	824	834	-
Stage 2	-	-	-	-	-	-	921	829	-	747	774	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1566	-	-	1448	-	-	718	679	939	589	660	1002
Mov Cap-2 Maneuver	-	-	-	-	-	-	718	679	-	589	660	-
Stage 1	-	-	-	-	-	-	871	785	-	818	825	-
Stage 2	-	-	-	-	-	-	892	820	-	699	769	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.6	10	9.9
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	804	1566	-	-	1448	-	-	755
HCM Lane V/C Ratio	0.104	0.006	-	-	0.009	-	-	0.028
HCM Control Delay (s)	10	7.3	0	-	7.5	0	-	9.9
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing PM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 10 - Reese Circle
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2576	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	103	vph
Length of first accel/decel lane	740	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	89	vph
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	740	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2576	103	89	vph
Peak-hour factor, PHF	0.95	0.95	0.98	
Peak 15-min volume, v15	678	27	23	v
Trucks and buses	6	4	1	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.971	0.980	0.995	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2793	111	91	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2793 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2904	4700	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2793 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	2904	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 23.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.326	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 57.5	mph

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	71	86	11	0	26	1	2	1	0	0	0	36
Future Vol, veh/h	71	86	11	0	26	1	2	1	0	0	0	36
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	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	3	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	76	91	12	0	28	1	2	1	0	0	0	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	29	0	0	103	0	0	295	277	97	277	282	28
Stage 1	-	-	-	-	-	-	248	248	-	28	28	-
Stage 2	-	-	-	-	-	-	47	29	-	249	254	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1597	-	-	1502	-	-	661	634	965	679	630	1053
Stage 1	-	-	-	-	-	-	760	705	-	994	876	-
Stage 2	-	-	-	-	-	-	972	875	-	759	701	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1597	-	-	1502	-	-	612	602	965	652	598	1053
Mov Cap-2 Maneuver	-	-	-	-	-	-	612	602	-	652	598	-
Stage 1	-	-	-	-	-	-	721	669	-	943	876	-
Stage 2	-	-	-	-	-	-	937	875	-	719	665	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.1	0	10.9	8.5
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	609	1597	-	-	1502	-	-	1053
HCM Lane V/C Ratio	0.005	0.047	-	-	-	-	-	0.036
HCM Control Delay (s)	10.9	7.4	0	-	0	-	-	8.5
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	16	1	0	0	1	4	0	0	15	1
Future Vol, veh/h	0	0	16	1	0	0	1	4	0	0	15	1
Conflicting Peds, #/hr	2	0	2	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	21	1	0	0	1	5	0	0	19	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	30	28	22	40	29	7	21	0	0	5	0	0
Stage 1	20	20	-	8	8	-	-	-	-	-	-	-
Stage 2	10	8	-	32	21	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	979	865	1055	964	864	1075	1595	-	-	1616	-	-
Stage 1	999	879	-	1013	889	-	-	-	-	-	-	-
Stage 2	1011	889	-	984	878	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	977	864	1053	943	863	1073	1592	-	-	1613	-	-
Mov Cap-2 Maneuver	977	864	-	943	863	-	-	-	-	-	-	-
Stage 1	998	879	-	1012	888	-	-	-	-	-	-	-
Stage 2	1008	888	-	963	878	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	8.8	1.5	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1592	-	-	1053	943	1613	-	-
HCM Lane V/C Ratio	0.001	-	-	0.019	0.001	-	-	-
HCM Control Delay (s)	7.3	0	-	8.5	8.8	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection

Int Delay, s/veh 5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	5	1	0	31	0	6	0	0	0	0	38
Future Vol, veh/h	7	5	1	0	31	0	6	0	0	0	0	38
Conflicting Peds, #/hr	0	0	3	3	0	0	3	0	3	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	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	40	2	2	6	2	2	2	2	2	2	2
Mvmt Flow	8	6	1	0	37	0	7	0	0	0	0	45

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	37	0	0	10	0	0	89	63	13	63	64	40
Stage 1	-	-	-	-	-	-	26	26	-	37	37	-
Stage 2	-	-	-	-	-	-	63	37	-	26	27	-
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	1574	-	-	1610	-	-	896	828	1067	932	827	1031
Stage 1	-	-	-	-	-	-	992	874	-	978	864	-
Stage 2	-	-	-	-	-	-	948	864	-	992	873	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1570	-	-	1606	-	-	849	822	1062	926	821	1028
Mov Cap-2 Maneuver	-	-	-	-	-	-	849	822	-	926	821	-
Stage 1	-	-	-	-	-	-	985	867	-	973	864	-
Stage 2	-	-	-	-	-	-	904	864	-	985	866	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.9	0	9.3	8.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	849	1570	-	-	1606	-	-	1028
HCM Lane V/C Ratio	0.008	0.005	-	-	-	-	-	0.044
HCM Control Delay (s)	9.3	7.3	0	-	0	-	-	8.7
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	3.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	29	5	82	116	18	19
Future Vol, veh/h	29	5	82	116	18	19
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	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	6	105	149	23	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	44	0	399	40
Stage 1	-	-	-	-	40	-
Stage 2	-	-	-	-	359	-
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	-	-	1564	-	607	1031
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1564	-	563	1031
Mov Cap-2 Maneuver	-	-	-	-	563	-
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	655	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	734	-	-	1564	-
HCM Lane V/C Ratio	0.065	-	-	0.067	-
HCM Control Delay (s)	10.2	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.2	-

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing + Project AM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 4 - Pesante Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1809	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	259	vph
Length of first accel/decel lane	295	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1809	259		vph
Peak-hour factor, PHF	0.89	0.89		
Peak 15-min volume, v15	508	73		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2155	297	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2155 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2452	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2155 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	2452	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.340	
Space mean speed in ramp influence area,	S_R = 57.2	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 57.2	mph

Movement	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL2	NWL	NWR
Lane Configurations												
Traffic Volume (veh/h)	19	53	56	77	9	162	10	21	12	208	40	5
Future Volume (veh/h)	19	53	56	77	9	162	10	21	12	208	40	5
Number	1	16	16	7	4	14	3	8	18	5	5	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99	0.99	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
Adj Sat Flow, veh/h/ln	1727	1810	1810	1810	1863	1900	1792	1808	1900	1776	1776	1900
Adj Flow Rate, veh/h	24	72	72	99	12	208	13	27	15	267	267	6
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	10	5	5	5	2	2	6	4	4	7	7	9
Cap, veh/h	48	192	192	321	16	281	78	50	28	327	327	54
Arrive On Green	0.03	0.13	0.13	0.19	0.19	0.19	0.05	0.05	0.05	0.19	0.19	0.30
Sat Flow, veh/h	1645	1526	1526	1723	87	1509	1707	1094	608	1691	1691	180
Grp Volume(v), veh/h	24	72	72	99	0	220	13	0	42	267	267	57
Grp Sat Flow(s),veh/h/ln	1645	1526	1526	1723	0	1596	1707	0	1701	1691	1691	1713
Q Serve(g_s), s	0.6	1.8	1.8	2.0	0.0	5.3	0.3	0.0	1.0	6.2	6.2	1.0
Cycle Q Clear(g_c), s	0.6	1.8	1.8	2.0	0.0	5.3	0.3	0.0	1.0	6.2	6.2	1.0
Prop In Lane	1.00	1.00	1.00	1.00		0.95	1.00		0.36	1.00	1.00	0.11
Lane Grp Cap(c), veh/h	48	192	192	321	0	298	78	0	77	327	327	509
V/C Ratio(X)	0.50	0.37	0.37	0.31	0.00	0.74	0.17	0.00	0.54	0.82	0.82	0.11
Avail Cap(c_a), veh/h	254	756	756	1074	0	995	1156	0	1152	1182	1182	1794
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	16.3	16.3	14.3	0.0	15.6	18.7	0.0	19.0	15.8	15.8	10.4
Incr Delay (d2), s/veh	3.0	2.4	2.4	0.2	0.0	1.4	0.4	0.0	2.2	1.9	1.9	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	0.3	0.9	0.9	1.0	0.0	2.4	0.1	0.0	0.5	3.0	3.0	0.5
LnGrp Delay(d),s/veh	22.5	18.8	18.8	14.5	0.0	17.0	19.1	0.0	21.2	17.7	17.7	10.6
LnGrp LOS	C	B	B	B		B	B		C	B	B	B
Approach Vol, veh/h	164				319			55		324	324	
Approach Delay, s/veh	19.0				16.2			20.7		16.4	16.4	
Approach LOS	B				B			C		B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.4	16.9		12.2	12.4	9.9		6.3
Change Period (Y+Rc), s	* 4.2	4.8		* 4.6	4.5	4.8		4.4
Max Green Setting (Gmax), s	* 6.3	42.7		* 25	28.5	20.2		27.6
Max Q Clear Time (g_c+I1), s	2.6	3.0		7.3	8.2	3.8		3.0
Green Ext Time (p_c), s	0.0	1.4		0.5	0.1	1.1		0.1

Intersection Summary

HCM 2010 Ctrl Delay		17.1	
HCM 2010 LOS		B	

Notes

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing + Project AM
Freeway/Dir of Travel:	US 101 / Southbound
Junction:	Intersection 6 - Blackie Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2325	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	225	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2325	225		vph
Peak-hour factor, PHF	0.83	0.83		
Peak 15-min volume, v15	700	68		v
Trucks and buses	9	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2927	277	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2927 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3204	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2927 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	3204	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 25.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.350	
Space mean speed in ramp influence area,	S_R = 57.0	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 57.0	mph

Intersection						
Int Delay, s/veh	4.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	185	4	125	132	4	93
Future Vol, veh/h	185	4	125	132	4	93
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	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	4	0	9
Mvmt Flow	191	4	129	136	4	96

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	301	197	0	0	265	0
Stage 1	197	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	695	849	-	-	1311	-
Stage 1	841	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	693	849	-	-	1311	-
Mov Cap-2 Maneuver	693	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	922	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.2	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	696	1311	-
HCM Lane V/C Ratio	-	-	0.28	0.003	-
HCM Control Delay (s)	-	-	12.2	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0	-

Intersection	
Int Delay, s/veh	4.2

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	20	95	50	228	162	123
Future Vol, veh/h	20	95	50	228	162	123
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	160	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	7	0	8	3	3	18
Mvmt Flow	21	101	53	243	172	131

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	53	0	-	0	53	56
Stage 1	-	-	-	-	53	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.17	-	-	-	6.43	6.38
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.263	-	-	-	3.527	3.462
Pot Cap-1 Maneuver	1521	-	-	-	953	967
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1517	-	-	-	940	965
Mov Cap-2 Maneuver	-	-	-	-	940	-
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	-	-

Approach	NB	SB	NE
HCM Control Delay, s	1.3	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	940	965	1517	-	-	-
HCM Lane V/C Ratio	0.183	0.136	0.014	-	-	-
HCM Control Delay (s)	9.7	9.3	7.4	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.7	0.5	0	-	-	-

Intersection

Int Delay, s/veh 5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	27	83	22	112	0	113	6	7	0	10	16
Future Vol, veh/h	3	27	83	22	112	0	113	6	7	0	10	16
Conflicting Peds, #/hr	10	0	16	15	0	10	16	0	15	10	0	11
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	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	6	1	2	6	2	2	2	4	50	0	6
Mvmt Flow	4	33	102	27	138	0	140	7	9	0	12	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	148	0	0	152	0	0	333	311	116	318	362	164
Stage 1	-	-	-	-	-	-	108	108	-	203	203	-
Stage 2	-	-	-	-	-	-	225	203	-	115	159	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.52	6.24	7.6	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4.018	3.336	3.95	4	3.354
Pot Cap-1 Maneuver	1446	-	-	1429	-	-	620	604	931	552	569	870
Stage 1	-	-	-	-	-	-	897	806	-	701	737	-
Stage 2	-	-	-	-	-	-	778	733	-	786	770	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1427	-	-	1411	-	-	569	577	907	520	543	851
Mov Cap-2 Maneuver	-	-	-	-	-	-	569	577	-	520	543	-
Stage 1	-	-	-	-	-	-	882	793	-	693	716	-
Stage 2	-	-	-	-	-	-	721	712	-	759	757	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.2	13.4	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	581	1427	-	-	1411	-	-	699
HCM Lane V/C Ratio	0.268	0.003	-	-	0.019	-	-	0.046
HCM Control Delay (s)	13.4	7.5	0	-	7.6	0	-	10.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0	-	-	0.1	-	-	0.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing + Project AM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 10 - Reese Circle
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	1884	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	129	vph
Length of first accel/decel lane	740	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	202	vph
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	740	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1884	129	202	vph
Peak-hour factor, PHF	0.96	0.96	0.89	
Peak 15-min volume, v15	491	34	57	v
Trucks and buses	10	2	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.985	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2061	136	230	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2061 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2197	4700	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2061 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	2197	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 17.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.289	
Space mean speed in ramp influence area,	S_R = 58.3	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 58.3	mph

Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	93	37	6	0	82	5	3	2	0	0	0	104
Future Vol, veh/h	93	37	6	0	82	5	3	2	0	0	0	104
Conflicting Peds, #/hr	1	0	1	0	0	0	1	0	0	0	0	1
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	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	15	5	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	100	40	6	0	88	5	3	2	0	0	0	112

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	95	0	0	47	0	0	392	339	44	336	339	93
Stage 1	-	-	-	-	-	-	244	244	-	92	92	-
Stage 2	-	-	-	-	-	-	148	95	-	244	247	-
Critical Hdwy	4.25	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.335	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1421	-	-	1573	-	-	571	586	1032	622	586	970
Stage 1	-	-	-	-	-	-	764	708	-	920	823	-
Stage 2	-	-	-	-	-	-	859	820	-	764	706	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1420	-	-	1573	-	-	476	543	1031	586	543	968
Mov Cap-2 Maneuver	-	-	-	-	-	-	476	543	-	586	543	-
Stage 1	-	-	-	-	-	-	708	656	-	853	822	-
Stage 2	-	-	-	-	-	-	759	819	-	707	655	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.3	0	12.3	9.2
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	501	1420	-	-	1573	-	-	968
HCM Lane V/C Ratio	0.011	0.07	-	-	-	-	-	0.116
HCM Control Delay (s)	12.3	7.7	0	-	0	-	-	9.2
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	0.4

Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	6	0	0	0	14	14	0	0	11	0
Future Vol, veh/h	0	0	6	0	0	0	14	14	0	0	11	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	17	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	6	0	0	0	15	15	0	0	12	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	57	57	12	60	57	15	12	0	0	15	0	0
Stage 1	12	12	-	45	45	-	-	-	-	-	-	-
Stage 2	45	45	-	15	12	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.37	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.453	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	940	834	1027	936	834	1065	1607	-	-	1603	-	-
Stage 1	1009	886	-	969	857	-	-	-	-	-	-	-
Stage 2	969	857	-	1005	886	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	934	826	1027	924	826	1065	1607	-	-	1603	-	-
Mov Cap-2 Maneuver	934	826	-	924	826	-	-	-	-	-	-	-
Stage 1	1000	886	-	960	849	-	-	-	-	-	-	-
Stage 2	960	849	-	999	886	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	0	3.6	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1607	-	-	1027	-	1603	-	-
HCM Lane V/C Ratio	0.009	-	-	0.006	-	-	-	-
HCM Control Delay (s)	7.3	0	-	8.5	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Intersection

Int Delay, s/veh 3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	28	27	6	0	15	1	2	0	0	0	0	17
Future Vol, veh/h	28	27	6	0	15	1	2	0	0	0	0	17
Conflicting Peds, #/hr	1	0	1	0	0	0	1	0	0	0	0	1
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	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	11	2	2	7	2	2	2	2	2	2	2
Mvmt Flow	32	31	7	0	17	1	2	0	0	0	0	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	19	0	0	39	0	0	127	118	35	117	121	20
Stage 1	-	-	-	-	-	-	99	99	-	19	19	-
Stage 2	-	-	-	-	-	-	28	19	-	98	102	-
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	1597	-	-	1571	-	-	846	772	1038	859	769	1058
Stage 1	-	-	-	-	-	-	907	813	-	1000	880	-
Stage 2	-	-	-	-	-	-	989	880	-	908	811	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1596	-	-	1571	-	-	816	755	1037	845	752	1056
Mov Cap-2 Maneuver	-	-	-	-	-	-	816	755	-	845	752	-
Stage 1	-	-	-	-	-	-	888	796	-	979	879	-
Stage 2	-	-	-	-	-	-	970	879	-	890	794	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.4	0	9.4	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	816	1596	-	-	1571	-	-	1056
HCM Lane V/C Ratio	0.003	0.02	-	-	-	-	-	0.018
HCM Control Delay (s)	9.4	7.3	0	-	0	-	-	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	3.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	103	2	28	50	6	87
Future Vol, veh/h	103	2	28	50	6	87
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	3
Mvmt Flow	112	2	30	54	7	95

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	114	0	228	113
Stage 1	-	-	-	-	113	-
Stage 2	-	-	-	-	115	-
Critical Hdwy	-	-	4.12	-	6.42	6.23
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.327
Pot Cap-1 Maneuver	-	-	1475	-	760	937
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	910	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1475	-	744	937
Mov Cap-2 Maneuver	-	-	-	-	744	-
Stage 1	-	-	-	-	912	-
Stage 2	-	-	-	-	891	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	922	-	-	1475	-
HCM Lane V/C Ratio	0.11	-	-	0.021	-
HCM Control Delay (s)	9.4	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing + Project PM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 4 - Pesante Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2589	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	93	vph
Length of first accel/decel lane	295	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2589	93		vph
Peak-hour factor, PHF	0.98	0.98		
Peak 15-min volume, v15	660	24		v
Trucks and buses	9	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2761	97	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2761 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2858	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2761 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	2858	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 25.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.362	
Space mean speed in ramp influence area,	S_R = 56.7	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 56.7	mph

Movement	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL2	NWL	NWR
Lane Configurations												
Traffic Volume (veh/h)	50	126	74	60	21	54	9	23	9	163	31	16
Future Volume (veh/h)	50	126	74	60	21	54	9	23	9	163	31	16
Number	1	16	16	7	4	14	3	8	18	5	5	12
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	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
Adj Sat Flow, veh/h/ln	1845	1845	1845	1827	1900	1900	1900	1889	1900	1810	1810	1900
Adj Flow Rate, veh/h	54	80	80	65	23	58	10	25	10	175	175	17
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	4	0	0	0	0	0	5	5	8
Cap, veh/h	103	264	264	191	53	133	74	52	21	246	246	151
Arrive On Green	0.06	0.17	0.17	0.11	0.11	0.11	0.04	0.04	0.04	0.14	0.14	0.26
Sat Flow, veh/h	1757	1568	1568	1740	479	1208	1810	1285	514	1723	1723	579
Grp Volume(v), veh/h	54	80	80	65	0	81	10	0	35	175	175	50
Grp Sat Flow(s),veh/h/ln	1757	1568	1568	1740	0	1687	1810	0	1799	1723	1723	1703
Q Serve(g_s), s	1.0	1.5	1.5	1.2	0.0	1.5	0.2	0.0	0.6	3.3	3.3	0.8
Cycle Q Clear(g_c), s	1.0	1.5	1.5	1.2	0.0	1.5	0.2	0.0	0.6	3.3	3.3	0.8
Prop In Lane	1.00	1.00	1.00	1.00		0.72	1.00		0.29	1.00	1.00	0.34
Lane Grp Cap(c), veh/h	103	264	264	191	0	186	74	0	73	246	246	445
V/C Ratio(X)	0.52	0.30	0.30	0.34	0.00	0.44	0.14	0.00	0.48	0.71	0.71	0.11
Avail Cap(c_a), veh/h	325	931	931	1299	0	1260	1468	0	1459	1444	1444	2137
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	12.4	12.4	14.0	0.0	14.1	15.7	0.0	16.0	13.9	13.9	9.6
Incr Delay (d2), s/veh	1.5	1.3	1.3	0.4	0.0	0.6	0.3	0.0	1.8	1.4	1.4	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	0.5	0.7	0.7	0.6	0.0	0.7	0.1	0.0	0.4	1.7	1.7	0.4
LnGrp Delay(d),s/veh	17.1	13.7	13.7	14.4	0.0	14.7	16.0	0.0	17.7	15.3	15.3	9.8
LnGrp LOS	B	B	B	B		B	B		B	B	B	A
Approach Vol, veh/h	269				146			45		225	225	
Approach Delay, s/veh	14.8				14.6			17.4		14.1	14.1	
Approach LOS	B				B			B		B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	13.7		8.3	9.4	10.5		5.8
Change Period (Y+Rc), s	* 4.2	4.8		* 4.6	4.5	4.8		4.4
Max Green Setting (Gmax), s	* 6.3	42.7		* 25	28.5	20.2		27.6
Max Q Clear Time (g_c+I1), s	3.0	2.8		3.5	5.3	4.2		2.6
Green Ext Time (p_c), s	0.0	2.0		0.2	0.1	1.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Notes

HCS 2010: Freeway Merge and Diverge Segments Release 6.70

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing + Project PM
Freeway/Dir of Travel:	US 101 / Southbound
Junction:	Intersection 6 - Blackie Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2940	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	189	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2940	189		vph
Peak-hour factor, PHF	0.96	0.96		
Peak 15-min volume, v15	766	49		v
Trucks and buses	7	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.966	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3170	201	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3170 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3371	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3170 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	3371	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 27.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.367	
Space mean speed in ramp influence area,	S_R = 56.6	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 56.6	mph

Intersection						
Int Delay, s/veh	2.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	62	5	98	154	21	78
Future Vol, veh/h	62	5	98	154	21	78
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	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	1	0	4
Mvmt Flow	67	5	107	167	23	85

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	320	190	0	0	274	0
Stage 1	190	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	678	857	-	-	1301	-
Stage 1	847	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	665	857	-	-	1301	-
Mov Cap-2 Maneuver	665	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	1.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	676	1301	-
HCM Lane V/C Ratio	-	-	0.108	0.018	-
HCM Control Delay (s)	-	-	11	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	5.9

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	19	34	24	116	218	42
Future Vol, veh/h	19	34	24	116	218	42
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	-	-	160	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	3	2	6
Mvmt Flow	21	37	26	126	237	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	26	0	-	0	26	26
Stage 1	-	-	-	-	26	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.1	-	-	-	6.42	6.26
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.354
Pot Cap-1 Maneuver	1601	-	-	-	989	1038
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1601	-	-	-	976	1038
Mov Cap-2 Maneuver	-	-	-	-	976	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	-	-

Approach	NB	SB	NE
HCM Control Delay, s	2.6	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	976	1038	1601	-	-	-
HCM Lane V/C Ratio	0.243	0.044	0.013	-	-	-
HCM Control Delay (s)	9.9	8.6	7.3	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	1	0.1	0	-	-	-

Intersection

Int Delay, s/veh 3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	70	44	11	44	1	26	9	33	2	8	7
Future Vol, veh/h	8	70	44	11	44	1	26	9	33	2	8	7
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	1	0	1
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	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	6	1	2	6	2	2	2	4	50	0	6
Mvmt Flow	10	86	54	14	54	1	32	11	41	2	10	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	57	0	0	141	0	0	225	217	115	243	243	57
Stage 1	-	-	-	-	-	-	133	133	-	83	83	-
Stage 2	-	-	-	-	-	-	92	84	-	160	160	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.52	6.24	7.6	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4.018	3.336	3.95	4	3.354
Pot Cap-1 Maneuver	1560	-	-	1442	-	-	730	681	932	622	662	998
Stage 1	-	-	-	-	-	-	870	786	-	819	830	-
Stage 2	-	-	-	-	-	-	915	825	-	741	769	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1559	-	-	1441	-	-	705	669	931	579	650	996
Mov Cap-2 Maneuver	-	-	-	-	-	-	705	669	-	579	650	-
Stage 1	-	-	-	-	-	-	864	780	-	813	821	-
Stage 2	-	-	-	-	-	-	886	816	-	693	764	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.5	10.1	10
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	793	1559	-	-	1441	-	-	746
HCM Lane V/C Ratio	0.106	0.006	-	-	0.009	-	-	0.028
HCM Control Delay (s)	10.1	7.3	0	-	7.5	0	-	10
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Existing + Project PM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 10 - Reese Circle
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2581	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	103	vph
Length of first accel/decel lane	740	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	89	vph
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	740	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2581	103	89	vph
Peak-hour factor, PHF	0.95	0.95	0.98	
Peak 15-min volume, v15	679	27	23	v
Trucks and buses	6	4	1	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.971	0.980	0.995	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2798	111	91	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2798 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2909	4700	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2798 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	2909	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 23.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.326	
Space mean speed in ramp influence area,	S_R = 57.5	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 57.5	mph

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	71	93	11	0	29	1	2	1	0	0	0	36
Future Vol, veh/h	71	93	11	0	29	1	2	1	0	0	0	36
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	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	3	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	76	99	12	0	31	1	2	1	0	0	0	38

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	32	0	0	111	0	0	307	288	105	287	293	31
Stage 1	-	-	-	-	-	-	256	256	-	31	31	-
Stage 2	-	-	-	-	-	-	51	32	-	256	262	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1593	-	-	1492	-	-	649	625	955	669	621	1049
Stage 1	-	-	-	-	-	-	753	699	-	991	873	-
Stage 2	-	-	-	-	-	-	967	872	-	753	695	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1593	-	-	1492	-	-	601	593	955	642	589	1049
Mov Cap-2 Maneuver	-	-	-	-	-	-	601	593	-	642	589	-
Stage 1	-	-	-	-	-	-	715	663	-	940	873	-
Stage 2	-	-	-	-	-	-	932	872	-	713	660	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3	0	11.1	8.6
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	598	1593	-	-	1492	-	-	1049
HCM Lane V/C Ratio	0.005	0.047	-	-	-	-	-	0.037
HCM Control Delay (s)	11.1	7.4	0	-	0	-	-	8.6
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	16	1	0	0	1	1	0	0	8	1
Future Vol, veh/h	0	0	16	1	0	0	1	1	0	0	8	1
Conflicting Peds, #/hr	2	0	2	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	21	1	0	0	1	1	0	0	10	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	17	15	13	27	16	3	12	0	0	1	0	0
Stage 1	11	11	-	4	4	-	-	-	-	-	-	-
Stage 2	6	4	-	23	12	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	998	879	1067	983	878	1081	1607	-	-	1622	-	-
Stage 1	1010	886	-	1018	892	-	-	-	-	-	-	-
Stage 2	1016	892	-	995	886	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	996	878	1065	962	877	1079	1604	-	-	1619	-	-
Mov Cap-2 Maneuver	996	878	-	962	877	-	-	-	-	-	-	-
Stage 1	1009	886	-	1017	891	-	-	-	-	-	-	-
Stage 2	1013	891	-	974	886	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.4	8.7	3.6	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1604	-	-	1065	962	1619	-	-
HCM Lane V/C Ratio	0.001	-	-	0.019	0.001	-	-	-
HCM Control Delay (s)	7.2	0	-	8.4	8.7	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	14	2	0	44	0	8	0	0	0	0	31
Future Vol, veh/h	4	14	2	0	44	0	8	0	0	0	0	31
Conflicting Peds, #/hr	0	0	3	3	0	0	3	0	3	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	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	40	2	2	6	2	2	2	2	2	2	2
Mvmt Flow	5	17	2	0	52	0	10	0	0	0	0	37

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	52	0	0	22	0	0	104	82	24	82	84	55
Stage 1	-	-	-	-	-	-	30	30	-	52	52	-
Stage 2	-	-	-	-	-	-	74	52	-	30	32	-
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	1554	-	-	1593	-	-	876	808	1052	905	806	1012
Stage 1	-	-	-	-	-	-	987	870	-	961	852	-
Stage 2	-	-	-	-	-	-	935	852	-	987	868	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1550	-	-	1589	-	-	838	804	1047	901	802	1009
Mov Cap-2 Maneuver	-	-	-	-	-	-	838	804	-	901	802	-
Stage 1	-	-	-	-	-	-	982	865	-	958	852	-
Stage 2	-	-	-	-	-	-	899	852	-	982	863	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0	9.3	8.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	838	1550	-	-	1589	-	-	1009
HCM Lane V/C Ratio	0.011	0.003	-	-	-	-	-	0.037
HCM Control Delay (s)	9.3	7.3	0	-	0	-	-	8.7
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	32	5	88	127	21	24
Future Vol, veh/h	32	5	88	127	21	24
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	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	6	113	163	27	31

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	47	0	432	44
Stage 1	-	-	-	-	44	-
Stage 2	-	-	-	-	388	-
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	-	-	1560	-	581	1026
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	686	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1560	-	535	1026
Mov Cap-2 Maneuver	-	-	-	-	535	-
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	718	-	-	1560	-
HCM Lane V/C Ratio	0.08	-	-	0.072	-
HCM Control Delay (s)	10.5	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative AM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 4 - Pesante Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3278	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	291	vph
Length of first accel/decel lane	295	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3278	291		vph
Peak-hour factor, PHF	0.89	0.89		
Peak 15-min volume, v15	921	82		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3904	334	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3904 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4238	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3904 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	4238	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 36.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	M_S = 0.565	
Space mean speed in ramp influence area,	S_R = 52.0	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 52.0	mph

Movement	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL2	NWL	NWR
Lane Configurations												
Traffic Volume (veh/h)	23	56	60	92	9	167	11	23	24	214	41	5
Future Volume (veh/h)	23	56	60	92	9	167	11	23	24	214	41	5
Number	1	16	16	7	4	14	3	8	18	5	5	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99	0.99	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
Adj Sat Flow, veh/h/ln	1727	1810	1810	1810	1863	1900	1792	1800	1900	1776	1776	1900
Adj Flow Rate, veh/h	29	77	77	118	12	214	14	29	31	274	274	6
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	10	5	5	5	2	2	6	4	4	7	7	9
Cap, veh/h	56	190	190	327	16	287	94	44	47	333	333	51
Arrive On Green	0.03	0.12	0.12	0.19	0.19	0.19	0.05	0.05	0.05	0.20	0.20	0.29
Sat Flow, veh/h	1645	1526	1526	1723	85	1511	1707	797	852	1691	1691	174
Grp Volume(v), veh/h	29	77	77	118	0	226	14	0	60	274	274	59
Grp Sat Flow(s),veh/h/ln	1645	1526	1526	1723	0	1596	1707	0	1650	1691	1691	1714
Q Serve(g_s), s	0.7	2.0	2.0	2.5	0.0	5.6	0.3	0.0	1.5	6.6	6.6	1.1
Cycle Q Clear(g_c), s	0.7	2.0	2.0	2.5	0.0	5.6	0.3	0.0	1.5	6.6	6.6	1.1
Prop In Lane	1.00	1.00	1.00	1.00		0.95	1.00		0.52	1.00	1.00	0.10
Lane Grp Cap(c), veh/h	56	190	190	327	0	303	94	0	91	333	333	505
V/C Ratio(X)	0.52	0.41	0.41	0.36	0.00	0.75	0.15	0.00	0.66	0.82	0.82	0.12
Avail Cap(c_a), veh/h	246	730	730	1037	0	961	1116	0	1079	1142	1142	1734
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.0	17.0	17.0	14.9	0.0	16.1	19.0	0.0	19.6	16.2	16.2	10.9
Incr Delay (d2), s/veh	2.7	2.8	2.8	0.2	0.0	1.4	0.3	0.0	3.0	1.9	1.9	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	0.4	1.0	1.0	1.2	0.0	2.6	0.2	0.0	0.8	3.2	3.2	0.5
LnGrp Delay(d),s/veh	22.7	19.9	19.9	15.1	0.0	17.5	19.3	0.0	22.6	18.2	18.2	11.1
LnGrp LOS	C	B	B	B		B	B		C	B	B	B
Approach Vol, veh/h	178				344			74		333	333	
Approach Delay, s/veh	19.9				16.7			22.0		16.9	16.9	
Approach LOS	B				B			C		B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	17.2		12.6	12.8	10.0		6.7
Change Period (Y+Rc), s	* 4.2	4.8		* 4.6	4.5	4.8		4.4
Max Green Setting (Gmax), s	* 6.3	42.7		* 25	28.5	20.2		27.6
Max Q Clear Time (g_c+I1), s	2.7	3.1		7.6	8.6	4.0		3.5
Green Ext Time (p_c), s	0.0	1.5		0.5	0.1	1.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.8
HCM 2010 LOS	B

Notes

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative AM
Freeway/Dir of Travel:	US 101 / Southbound
Junction:	Intersection 6 - Blackie Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3995	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	234	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3995	234		vph
Peak-hour factor, PHF	0.83	0.83		
Peak 15-min volume, v15	1203	70		v
Trucks and buses	9	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	5030	288	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 5030 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5318	4700	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 5030 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	5318	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 42.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 1.049	
Space mean speed in ramp influence area,	S_R = 40.9	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 40.9	mph

Intersection						
Int Delay, s/veh	4.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	201	6	146	165	5	109
Future Vol, veh/h	201	6	146	165	5	109
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	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	4	0	9
Mvmt Flow	207	6	151	170	5	112

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	359	236	0	0	321	0
Stage 1	236	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	644	808	-	-	1250	-
Stage 1	808	-	-	-	-	-
Stage 2	907	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	641	808	-	-	1250	-
Mov Cap-2 Maneuver	641	-	-	-	-	-
Stage 1	808	-	-	-	-	-
Stage 2	903	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	645	1250	-
HCM Lane V/C Ratio	-	-	0.331	0.004	-
HCM Control Delay (s)	-	-	13.3	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.4	0	-

Intersection						
Int Delay, s/veh	3.9					

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	23	143	65	245	168	129
Future Vol, veh/h	23	143	65	245	168	129
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	160	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	7	0	8	3	3	18
Mvmt Flow	24	152	69	261	179	137

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	69	0	-	0	69	72
Stage 1	-	-	-	-	69	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.17	-	-	-	6.43	6.38
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.263	-	-	-	3.527	3.462
Pot Cap-1 Maneuver	1501	-	-	-	933	947
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1497	-	-	-	918	945
Mov Cap-2 Maneuver	-	-	-	-	918	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	-	-

Approach	NB	SB	NE
HCM Control Delay, s	1	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	918	945	1497	-	-	-
HCM Lane V/C Ratio	0.195	0.145	0.016	-	-	-
HCM Control Delay (s)	9.9	9.5	7.4	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.7	0.5	0.1	-	-	-

Intersection

Int Delay, s/veh 6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	28	93	25	123	0	131	7	9	0	12	19
Future Vol, veh/h	4	28	93	25	123	0	131	7	9	0	12	19
Conflicting Peds, #/hr	10	0	16	15	0	10	16	0	15	10	0	11
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	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	6	1	2	6	2	2	2	4	50	0	6
Mvmt Flow	5	35	115	31	152	0	162	9	11	0	15	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	162	0	0	165	0	0	367	342	123	351	399	178
Stage 1	-	-	-	-	-	-	118	118	-	224	224	-
Stage 2	-	-	-	-	-	-	249	224	-	127	175	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.52	6.24	7.6	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4.018	3.336	3.95	4	3.354
Pot Cap-1 Maneuver	1429	-	-	1413	-	-	589	580	923	523	542	855
Stage 1	-	-	-	-	-	-	887	798	-	682	722	-
Stage 2	-	-	-	-	-	-	755	718	-	774	758	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1410	-	-	1395	-	-	534	552	899	489	516	837
Mov Cap-2 Maneuver	-	-	-	-	-	-	534	552	-	489	516	-
Stage 1	-	-	-	-	-	-	872	784	-	674	699	-
Stage 2	-	-	-	-	-	-	692	695	-	744	745	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.3	14.8	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	548	1410	-	-	1395	-	-	675
HCM Lane V/C Ratio	0.331	0.004	-	-	0.022	-	-	0.057
HCM Control Delay (s)	14.8	7.6	0	-	7.6	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.4	0	-	-	0.1	-	-	0.2

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative AM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 10 - Reese Circle
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3342	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	740	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	202	vph
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	740	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3342	152	202	vph
Peak-hour factor, PHF	0.96	0.96	0.89	
Peak 15-min volume, v15	870	40	57	v
Trucks and buses	10	2	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.985	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3655	160	230	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3655 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3815	4700	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3655 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	3815	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 30.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.431	
Space mean speed in ramp influence area,	S_R = 55.1	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 55.1	mph

Intersection

Int Delay, s/veh 5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	117	45	8	0	84	9	4	2	0	0	0	119
Future Vol, veh/h	117	45	8	0	84	9	4	2	0	0	0	119
Conflicting Peds, #/hr	1	0	1	0	0	0	1	0	0	0	0	1
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	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	15	5	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	126	48	9	0	90	10	4	2	0	0	0	128

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	101	0	0	58	0	0	465	406	54	401	406	97
Stage 1	-	-	-	-	-	-	305	305	-	96	96	-
Stage 2	-	-	-	-	-	-	160	101	-	305	310	-
Critical Hdwy	4.25	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.335	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1414	-	-	1559	-	-	511	537	1019	563	537	965
Stage 1	-	-	-	-	-	-	709	666	-	916	819	-
Stage 2	-	-	-	-	-	-	847	815	-	709	663	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1413	-	-	1559	-	-	411	487	1018	521	487	963
Mov Cap-2 Maneuver	-	-	-	-	-	-	411	487	-	521	487	-
Stage 1	-	-	-	-	-	-	643	604	-	831	818	-
Stage 2	-	-	-	-	-	-	734	814	-	641	602	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.4	0	13.4	9.3
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	434	1413	-	-	1559	-	-	963
HCM Lane V/C Ratio	0.015	0.089	-	-	-	-	-	0.133
HCM Control Delay (s)	13.4	7.8	0	-	0	-	-	9.3
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.3	-	-	0	-	-	0.5

Intersection

Int Delay, s/veh 4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	6	0	0	0	14	5	0	0	6	0
Future Vol, veh/h	0	0	6	0	0	0	14	5	0	0	6	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	17	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	6	0	0	0	15	5	0	0	6	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	41	41	6	45	41	5	6	0	0	5	0	0
Stage 1	6	6	-	35	35	-	-	-	-	-	-	-
Stage 2	35	35	-	10	6	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.37	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.453	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	963	851	1035	957	851	1078	1615	-	-	1616	-	-
Stage 1	1016	891	-	981	866	-	-	-	-	-	-	-
Stage 2	981	866	-	1011	891	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	956	843	1035	945	843	1078	1615	-	-	1616	-	-
Mov Cap-2 Maneuver	956	843	-	945	843	-	-	-	-	-	-	-
Stage 1	1007	891	-	972	858	-	-	-	-	-	-	-
Stage 2	972	858	-	1005	891	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	0	5.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1615	-	-	1035	-	1616	-	-
HCM Lane V/C Ratio	0.009	-	-	0.006	-	-	-	-
HCM Control Delay (s)	7.2	0	-	8.5	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

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	19	43	10	0	23	1	3	0	0	0	0	12
Future Vol, veh/h	19	43	10	0	23	1	3	0	0	0	0	12
Conflicting Peds, #/hr	1	0	1	0	0	0	1	0	0	0	0	1
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	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	11	2	2	7	2	2	2	2	2	2	2
Mvmt Flow	22	49	11	0	26	1	3	0	0	0	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	28	0	0	61	0	0	134	127	56	126	132	29
Stage 1	-	-	-	-	-	-	99	99	-	28	28	-
Stage 2	-	-	-	-	-	-	35	28	-	98	104	-
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	1585	-	-	1542	-	-	838	764	1011	848	759	1046
Stage 1	-	-	-	-	-	-	907	813	-	989	872	-
Stage 2	-	-	-	-	-	-	981	872	-	908	809	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1584	-	-	1542	-	-	817	752	1010	838	747	1044
Mov Cap-2 Maneuver	-	-	-	-	-	-	817	752	-	838	747	-
Stage 1	-	-	-	-	-	-	894	801	-	974	871	-
Stage 2	-	-	-	-	-	-	967	871	-	895	797	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0	9.4	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	817	1584	-	-	1542	-	-	1044
HCM Lane V/C Ratio	0.004	0.014	-	-	-	-	-	0.013
HCM Control Delay (s)	9.4	7.3	0	-	0	-	-	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

Intersection

Int Delay, s/veh 3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	117	6	30	55	7	92
Future Vol, veh/h	117	6	30	55	7	92
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	3
Mvmt Flow	127	7	33	60	8	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	134	0	255	130
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	125	-
Critical Hdwy	-	-	4.12	-	6.42	6.23
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.327
Pot Cap-1 Maneuver	-	-	1451	-	734	917
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	901	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1451	-	716	917
Mov Cap-2 Maneuver	-	-	-	-	716	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	879	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	899	-	-	1451	-
HCM Lane V/C Ratio	0.12	-	-	0.022	-
HCM Control Delay (s)	9.5	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative PM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 4 - Pesante Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4475	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	101	vph
Length of first accel/decel lane	295	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4475	101		vph
Peak-hour factor, PHF	0.98	0.98		
Peak 15-min volume, v15	1142	26		v
Trucks and buses	9	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4772	105	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4772 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4877	4700	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4772 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	4877	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 41.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 0.806

Space mean speed in ramp influence area, S_R = 46.5 mph

Space mean speed in outer lanes, S = N/A mph

Space mean speed for all vehicles, S = 46.5 mph

Movement	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL2	NWL	NWR
Lane Configurations												
Traffic Volume (veh/h)	60	131	79	71	22	52	10	25	18	164	53	17
Future Volume (veh/h)	60	131	79	71	22	52	10	25	18	164	53	17
Number	1	16	16	7	4	14	3	8	18	5	5	12
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	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
Adj Sat Flow, veh/h/ln	1845	1845	1845	1827	1900	1900	1900	1884	1900	1810	1810	1900
Adj Flow Rate, veh/h	65	85	85	76	24	56	11	27	19	176	176	18
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	4	0	0	0	0	0	5	5	8
Cap, veh/h	118	274	274	194	57	132	88	50	35	242	242	106
Arrive On Green	0.07	0.18	0.18	0.11	0.11	0.11	0.05	0.05	0.05	0.14	0.14	0.26
Sat Flow, veh/h	1757	1568	1568	1740	507	1184	1810	1031	725	1723	1723	412
Grp Volume(v), veh/h	65	85	85	76	0	80	11	0	46	176	176	75
Grp Sat Flow(s),veh/h/ln	1757	1568	1568	1740	0	1691	1810	0	1756	1723	1723	1718
Q Serve(g_s), s	1.3	1.7	1.7	1.4	0.0	1.5	0.2	0.0	0.9	3.4	3.4	1.2
Cycle Q Clear(g_c), s	1.3	1.7	1.7	1.4	0.0	1.5	0.2	0.0	0.9	3.4	3.4	1.2
Prop In Lane	1.00	1.00	1.00	1.00		0.70	1.00		0.41	1.00	1.00	0.24
Lane Grp Cap(c), veh/h	118	274	274	194	0	189	88	0	85	242	242	442
V/C Ratio(X)	0.55	0.31	0.31	0.39	0.00	0.42	0.12	0.00	0.54	0.73	0.73	0.17
Avail Cap(c_a), veh/h	317	907	907	1265	0	1230	1430	0	1388	1406	1406	2101
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.8	12.6	12.6	14.4	0.0	14.5	15.9	0.0	16.2	14.4	14.4	10.1
Incr Delay (d2), s/veh	1.5	1.3	1.3	0.5	0.0	0.6	0.2	0.0	1.9	1.6	1.6	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	0.6	0.8	0.8	0.7	0.0	0.7	0.1	0.0	0.5	1.7	1.7	0.6
LnGrp Delay(d),s/veh	17.3	13.9	13.9	14.9	0.0	15.0	16.1	0.0	18.2	15.9	15.9	10.4
LnGrp LOS	B	B	B	B		B	B		B	B	B	B
Approach Vol, veh/h	291				156			57		251	251	
Approach Delay, s/veh	15.1				15.0			17.8		14.3	14.3	
Approach LOS	B				B			B		B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.5	13.8		8.5	9.4	10.9		6.1
Change Period (Y+Rc), s	* 4.2	4.8		* 4.6	4.5	4.8		4.4
Max Green Setting (Gmax), s	* 6.3	42.7		* 25	28.5	20.2		27.6
Max Q Clear Time (g_c+I1), s	3.3	3.2		3.5	5.4	4.4		2.9
Green Ext Time (p_c), s	0.0	2.2		0.2	0.1	1.7		0.1

Intersection Summary			
HCM 2010 Ctrl Delay		15.0	
HCM 2010 LOS		B	

Notes

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative PM
Freeway/Dir of Travel:	US 101 / Southbound
Junction:	Intersection 6 - Blackie Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4547	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	193	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4547	193		vph
Peak-hour factor, PHF	0.96	0.96		
Peak 15-min volume, v15	1184	50		v
Trucks and buses	7	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.966	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4902	205	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4902 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5107	4700	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4902 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	5107	4600	Yes

Level of Service Determination (if not F)

$D = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 40.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 0.898

Space mean speed in ramp influence area, S_R = 44.4 mph

Space mean speed in outer lanes, S = N/A mph

Space mean speed for all vehicles, S = 44.4 mph

Intersection						
Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	7	115	170	24	92
Future Vol, veh/h	76	7	115	170	24	92
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	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	1	0	4
Mvmt Flow	83	8	125	185	26	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	369	217	0	0	310	0
Stage 1	217	-	-	-	-	-
Stage 2	152	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	635	828	-	-	1262	-
Stage 1	824	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	621	828	-	-	1262	-
Mov Cap-2 Maneuver	621	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	862	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	1.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	634	1262	-
HCM Lane V/C Ratio	-	-	0.142	0.021	-
HCM Control Delay (s)	-	-	11.6	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection						
Int Delay, s/veh	5.4					

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	21	63	44	124	222	46
Future Vol, veh/h	21	63	44	124	222	46
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	-	-	160	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	3	2	6
Mvmt Flow	23	68	48	135	241	50

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	48	0	-	0	48	48
Stage 1	-	-	-	-	48	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.1	-	-	-	6.42	6.26
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.354
Pot Cap-1 Maneuver	1572	-	-	-	962	1010
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1572	-	-	-	948	1010
Mov Cap-2 Maneuver	-	-	-	-	948	-
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	-	-

Approach	NB	SB	NE
HCM Control Delay, s	1.8	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	948	1010	1572	-	-	-
HCM Lane V/C Ratio	0.255	0.05	0.015	-	-	-
HCM Control Delay (s)	10.1	8.8	7.3	-	-	-
HCM Lane LOS	B	A	A	-	-	-
HCM 95th %tile Q(veh)	1	0.2	0	-	-	-

Intersection

Int Delay, s/veh 3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	83	56	13	47	2	30	11	37	3	9	8
Future Vol, veh/h	10	83	56	13	47	2	30	11	37	3	9	8
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	1	0	1
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	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	6	1	2	6	2	2	2	4	50	0	6
Mvmt Flow	12	102	69	16	58	2	37	14	46	4	11	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	172	0	0	265	256	138	284	288	61
Stage 1	-	-	-	-	-	-	162	162	-	92	92	-
Stage 2	-	-	-	-	-	-	103	94	-	192	196	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.52	6.24	7.6	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4.018	3.336	3.95	4	3.354
Pot Cap-1 Maneuver	1555	-	-	1405	-	-	688	648	905	582	625	993
Stage 1	-	-	-	-	-	-	840	764	-	809	823	-
Stage 2	-	-	-	-	-	-	903	817	-	711	742	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1554	-	-	1404	-	-	660	634	904	534	611	991
Mov Cap-2 Maneuver	-	-	-	-	-	-	660	634	-	534	611	-
Stage 1	-	-	-	-	-	-	832	757	-	801	812	-
Stage 2	-	-	-	-	-	-	870	807	-	656	735	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.6	10.5	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	752	1554	-	-	1404	-	-	704
HCM Lane V/C Ratio	0.128	0.008	-	-	0.011	-	-	0.035
HCM Control Delay (s)	10.5	7.3	0	-	7.6	0	-	10.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative PM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 10 - Reese Circle
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4475	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	122	vph
Length of first accel/decel lane	740	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	89	vph
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	740	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4475	122	89	vph
Peak-hour factor, PHF	0.95	0.95	0.98	
Peak 15-min volume, v15	1178	32	23	v
Trucks and buses	6	4	1	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.971	0.980	0.995	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4852	131	91	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4852 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4983	4700	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4852 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	4983	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 39.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 0.823

Space mean speed in ramp influence area, S_R = 46.1 mph

Space mean speed in outer lanes, S = N/A mph

Space mean speed for all vehicles, S = 46.1 mph

Intersection

Int Delay, s/veh 3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	82	99	13	0	29	7	3	1	0	0	0	51
Future Vol, veh/h	82	99	13	0	29	7	3	1	0	0	0	51
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	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	3	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	87	105	14	0	31	7	3	1	0	0	0	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	38	0	0	119	0	0	349	325	112	322	329	35
Stage 1	-	-	-	-	-	-	287	287	-	35	35	-
Stage 2	-	-	-	-	-	-	62	38	-	287	294	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1585	-	-	1482	-	-	609	596	947	635	593	1044
Stage 1	-	-	-	-	-	-	725	678	-	986	870	-
Stage 2	-	-	-	-	-	-	954	867	-	725	673	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1585	-	-	1482	-	-	551	561	947	605	558	1044
Mov Cap-2 Maneuver	-	-	-	-	-	-	551	561	-	605	558	-
Stage 1	-	-	-	-	-	-	682	638	-	928	870	-
Stage 2	-	-	-	-	-	-	904	867	-	681	633	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.1	0	11.6	8.6
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	553	1585	-	-	1482	-	-	1044
HCM Lane V/C Ratio	0.008	0.055	-	-	-	-	-	0.052
HCM Control Delay (s)	11.6	7.4	0	-	0	-	-	8.6
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	0.2

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	16	1	0	0	1	5	0	0	18	1
Future Vol, veh/h	0	0	16	1	0	0	1	5	0	0	18	1
Conflicting Peds, #/hr	2	0	2	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	21	1	0	0	1	6	0	0	23	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	35	33	26	45	33	8	24	0	0	6	0	0
Stage 1	24	24	-	9	9	-	-	-	-	-	-	-
Stage 2	11	9	-	36	24	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	971	860	1050	957	860	1074	1591	-	-	1615	-	-
Stage 1	994	875	-	1012	888	-	-	-	-	-	-	-
Stage 2	1010	888	-	980	875	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	969	859	1048	936	859	1072	1588	-	-	1612	-	-
Mov Cap-2 Maneuver	969	859	-	936	859	-	-	-	-	-	-	-
Stage 1	993	875	-	1011	887	-	-	-	-	-	-	-
Stage 2	1007	887	-	959	875	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	8.9	1.2	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1588	-	-	1048	936	1612	-	-
HCM Lane V/C Ratio	0.001	-	-	0.02	0.001	-	-	-
HCM Control Delay (s)	7.3	0	-	8.5	8.9	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection

Int Delay, s/veh 4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	14	2	0	44	0	8	0	0	0	0	41
Future Vol, veh/h	8	14	2	0	44	0	8	0	0	0	0	41
Conflicting Peds, #/hr	0	0	3	3	0	0	3	0	3	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	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	40	2	2	6	2	2	2	2	2	2	2
Mvmt Flow	10	17	2	0	52	0	10	0	0	0	0	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	52	0	0	22	0	0	120	92	24	92	93	55
Stage 1	-	-	-	-	-	-	40	40	-	52	52	-
Stage 2	-	-	-	-	-	-	80	52	-	40	41	-
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	1554	-	-	1593	-	-	855	798	1052	892	797	1012
Stage 1	-	-	-	-	-	-	975	862	-	961	852	-
Stage 2	-	-	-	-	-	-	929	852	-	975	861	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1550	-	-	1589	-	-	805	790	1047	885	789	1009
Mov Cap-2 Maneuver	-	-	-	-	-	-	805	790	-	885	789	-
Stage 1	-	-	-	-	-	-	966	854	-	954	852	-
Stage 2	-	-	-	-	-	-	882	852	-	966	853	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0	9.5	8.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	805	1550	-	-	1589	-	-	1009
HCM Lane V/C Ratio	0.012	0.006	-	-	-	-	-	0.048
HCM Control Delay (s)	9.5	7.3	0	-	0	-	-	8.7
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Intersection

Int Delay, s/veh 3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	34	5	93	132	21	26
Future Vol, veh/h	34	5	93	132	21	26
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	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	6	119	169	27	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	50	0	455	47
Stage 1	-	-	-	-	47	-
Stage 2	-	-	-	-	408	-
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	-	-	1557	-	563	1022
Stage 1	-	-	-	-	975	-
Stage 2	-	-	-	-	671	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1557	-	516	1022
Mov Cap-2 Maneuver	-	-	-	-	516	-
Stage 1	-	-	-	-	975	-
Stage 2	-	-	-	-	615	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.1	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	711	-	-	1557	-
HCM Lane V/C Ratio	0.085	-	-	0.077	-
HCM Control Delay (s)	10.5	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative + Project AM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 4 - Pesante Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3278	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	296	vph
Length of first accel/decel lane	295	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3278	296		vph
Peak-hour factor, PHF	0.89	0.89		
Peak 15-min volume, v15	921	83		v
Trucks and buses	12	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.943	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3904	339	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3904 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4243	4700	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3904 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	4243	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 36.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	M_S = 0.566	
Space mean speed in ramp influence area,	S_R = 52.0	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 52.0	mph

Movement	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL2	NWL	NWR
Lane Configurations												
Traffic Volume (veh/h)	23	56	60	92	9	171	11	23	24	216	41	5
Future Volume (veh/h)	23	56	60	92	9	171	11	23	24	216	41	5
Number	1	16	16	7	4	14	3	8	18	5	5	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99	0.99	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
Adj Sat Flow, veh/h/ln	1727	1810	1810	1810	1863	1900	1792	1800	1900	1776	1776	1900
Adj Flow Rate, veh/h	29	77	77	118	12	219	14	29	31	277	277	6
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	10	5	5	5	2	2	6	4	4	7	7	9
Cap, veh/h	56	189	189	333	16	292	94	44	47	336	336	51
Arrive On Green	0.03	0.12	0.12	0.19	0.19	0.19	0.05	0.05	0.05	0.20	0.20	0.30
Sat Flow, veh/h	1645	1526	1526	1723	83	1513	1707	797	852	1691	1691	174
Grp Volume(v), veh/h	29	77	77	118	0	231	14	0	60	277	277	59
Grp Sat Flow(s),veh/h/ln	1645	1526	1526	1723	0	1596	1707	0	1650	1691	1691	1714
Q Serve(g_s), s	0.7	2.0	2.0	2.5	0.0	5.8	0.3	0.0	1.5	6.7	6.7	1.1
Cycle Q Clear(g_c), s	0.7	2.0	2.0	2.5	0.0	5.8	0.3	0.0	1.5	6.7	6.7	1.1
Prop In Lane	1.00	1.00	1.00	1.00		0.95	1.00		0.52	1.00	1.00	0.10
Lane Grp Cap(c), veh/h	56	189	189	333	0	308	94	0	90	336	336	506
V/C Ratio(X)	0.52	0.41	0.41	0.35	0.00	0.75	0.15	0.00	0.66	0.82	0.82	0.12
Avail Cap(c_a), veh/h	243	724	724	1028	0	952	1106	0	1069	1132	1132	1719
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	17.2	17.2	14.9	0.0	16.2	19.2	0.0	19.7	16.3	16.3	10.9
Incr Delay (d2), s/veh	2.7	2.9	2.9	0.2	0.0	1.4	0.3	0.0	3.1	2.0	2.0	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	0.4	1.0	1.0	1.2	0.0	2.7	0.2	0.0	0.8	3.3	3.3	0.5
LnGrp Delay(d),s/veh	22.9	20.1	20.1	15.1	0.0	17.6	19.5	0.0	22.8	18.3	18.3	11.2
LnGrp LOS	C	C	C	B		B	B		C	B	B	B
Approach Vol, veh/h	178				349			74		336	336	
Approach Delay, s/veh	20.1				16.8			22.2		17.0	17.0	
Approach LOS	C				B			C		B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	17.4		12.8	13.0	10.1		6.7
Change Period (Y+Rc), s	* 4.2	4.8		* 4.6	4.5	4.8		4.4
Max Green Setting (Gmax), s	* 6.3	42.7		* 25	28.5	20.2		27.6
Max Q Clear Time (g_c+I1), s	2.7	3.1		7.8	8.7	4.0		3.5
Green Ext Time (p_c), s	0.0	1.5		0.5	0.1	1.1		0.1

Intersection Summary			
HCM 2010 Ctrl Delay		17.9	
HCM 2010 LOS		B	

Notes

HCS 2010: Freeway Merge and Diverge Segments Release 6.70

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative + Project AM
Freeway/Dir of Travel:	US 101 / Southbound
Junction:	Intersection 6 - Blackie Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3995	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	238	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3995	238		vph
Peak-hour factor, PHF	0.83	0.83		
Peak 15-min volume, v15	1203	72		v
Trucks and buses	9	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	5030	292	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 5030 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5322	4700	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 5030 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	5322	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 42.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 1.052

Space mean speed in ramp influence area, S_R = 40.8 mph

Space mean speed in outer lanes, S = N/A mph

Space mean speed for all vehicles, S = 40.8 mph

Intersection	
Int Delay, s/veh	4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	206	6	146	167	5	109
Future Vol, veh/h	206	6	146	167	5	109
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	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	4	0	9
Mvmt Flow	212	6	151	172	5	112

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	360	237	0	0	323	0
Stage 1	237	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	643	807	-	-	1248	-
Stage 1	807	-	-	-	-	-
Stage 2	907	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	640	807	-	-	1248	-
Mov Cap-2 Maneuver	640	-	-	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	903	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	644	1248	-
HCM Lane V/C Ratio	-	-	0.339	0.004	-
HCM Control Delay (s)	-	-	13.4	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.5	0	-

Intersection	
Int Delay, s/veh	3.9

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	23	143	66	249	170	129
Future Vol, veh/h	23	143	66	249	170	129
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	160	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	7	0	8	3	3	18
Mvmt Flow	24	152	70	265	181	137

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	70	0	-	0	70	73
Stage 1	-	-	-	-	70	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.17	-	-	-	6.43	6.38
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.263	-	-	-	3.527	3.462
Pot Cap-1 Maneuver	1499	-	-	-	932	946
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1495	-	-	-	917	944
Mov Cap-2 Maneuver	-	-	-	-	917	-
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	-	-

Approach	NB	SB	NE
HCM Control Delay, s	1	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	917	944	1495	-	-	-
HCM Lane V/C Ratio	0.197	0.145	0.016	-	-	-
HCM Control Delay (s)	9.9	9.5	7.4	-	-	-
HCM Lane LOS	A	A	A	-	-	-
HCM 95th %tile Q(veh)	0.7	0.5	0.1	-	-	-

Intersection

Int Delay, s/veh 6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	30	93	25	128	0	131	7	9	0	12	19
Future Vol, veh/h	4	30	93	25	128	0	131	7	9	0	12	19
Conflicting Peds, #/hr	10	0	16	15	0	10	16	0	15	10	0	11
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	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	6	1	2	6	2	2	2	4	50	0	6
Mvmt Flow	5	37	115	31	158	0	162	9	11	0	15	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	168	0	0	168	0	0	375	350	125	359	408	184
Stage 1	-	-	-	-	-	-	120	120	-	230	230	-
Stage 2	-	-	-	-	-	-	255	230	-	129	178	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.52	6.24	7.6	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4.018	3.336	3.95	4	3.354
Pot Cap-1 Maneuver	1422	-	-	1410	-	-	582	574	920	517	536	848
Stage 1	-	-	-	-	-	-	884	796	-	676	718	-
Stage 2	-	-	-	-	-	-	749	714	-	772	756	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1403	-	-	1392	-	-	527	546	896	483	510	830
Mov Cap-2 Maneuver	-	-	-	-	-	-	527	546	-	483	510	-
Stage 1	-	-	-	-	-	-	869	782	-	668	695	-
Stage 2	-	-	-	-	-	-	686	691	-	742	743	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.2	14.9	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	542	1403	-	-	1392	-	-	668
HCM Lane V/C Ratio	0.335	0.004	-	-	0.022	-	-	0.057
HCM Control Delay (s)	14.9	7.6	0	-	7.6	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.5	0	-	-	0.1	-	-	0.2

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative + Project AM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 10 - Reese Circle
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3344	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	740	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	202	vph
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	740	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3344	152	202	vph
Peak-hour factor, PHF	0.96	0.96	0.89	
Peak 15-min volume, v15	871	40	57	v
Trucks and buses	10	2	3	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.952	0.990	0.985	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3658	160	230	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3658 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3818	4700	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3658 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	3818	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 30.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M_S = 0.432	
Space mean speed in ramp influence area,	S_R = 55.1	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 55.1	mph

Intersection

Int Delay, s/veh 5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	117	47	8	0	89	9	4	2	0	0	0	119
Future Vol, veh/h	117	47	8	0	89	9	4	2	0	0	0	119
Conflicting Peds, #/hr	1	0	1	0	0	0	1	0	0	0	0	1
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	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	15	5	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	126	51	9	0	96	10	4	2	0	0	0	128

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	106	0	0	60	0	0	473	413	56	410	414	103
Stage 1	-	-	-	-	-	-	307	307	-	102	102	-
Stage 2	-	-	-	-	-	-	166	106	-	308	312	-
Critical Hdwy	4.25	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.335	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1408	-	-	1556	-	-	505	532	1016	556	532	957
Stage 1	-	-	-	-	-	-	707	665	-	909	815	-
Stage 2	-	-	-	-	-	-	841	811	-	706	661	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1407	-	-	1556	-	-	406	482	1015	514	482	955
Mov Cap-2 Maneuver	-	-	-	-	-	-	406	482	-	514	482	-
Stage 1	-	-	-	-	-	-	641	603	-	824	814	-
Stage 2	-	-	-	-	-	-	728	810	-	638	599	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.3	0	13.5	9.4
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	429	1407	-	-	1556	-	-	955
HCM Lane V/C Ratio	0.015	0.089	-	-	-	-	-	0.134
HCM Control Delay (s)	13.5	7.8	0	-	0	-	-	9.4
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.3	-	-	0	-	-	0.5

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	0	6	0	0	0	14	17	0	0	13	0
Future Vol, veh/h	0	0	6	0	0	0	14	17	0	0	13	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	17	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	6	0	0	0	15	18	0	0	14	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	62	62	14	65	62	18	14	0	0	18	0	0
Stage 1	14	14	-	48	48	-	-	-	-	-	-	-
Stage 2	48	48	-	17	14	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.37	7.12	6.52	6.22	4.12	-	-	4.12	-	-
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	3.518	4.018	3.453	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	933	829	1024	929	829	1061	1604	-	-	1599	-	-
Stage 1	1006	884	-	965	855	-	-	-	-	-	-	-
Stage 2	965	855	-	1002	884	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	927	822	1024	917	822	1061	1604	-	-	1599	-	-
Mov Cap-2 Maneuver	927	822	-	917	822	-	-	-	-	-	-	-
Stage 1	997	884	-	956	847	-	-	-	-	-	-	-
Stage 2	956	847	-	996	884	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.5	0	3.3	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1604	-	-	1024	-	1599	-	-
HCM Lane V/C Ratio	0.009	-	-	0.006	-	-	-	-
HCM Control Delay (s)	7.3	0	-	8.5	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Intersection

Int Delay, s/veh 3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	31	43	10	0	23	1	3	0	0	0	0	19
Future Vol, veh/h	31	43	10	0	23	1	3	0	0	0	0	19
Conflicting Peds, #/hr	1	0	1	0	0	0	1	0	0	0	0	1
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	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	11	2	2	7	2	2	2	2	2	2	2
Mvmt Flow	35	49	11	0	26	1	3	0	0	0	0	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	28	0	0	61	0	0	165	154	56	153	160	29
Stage 1	-	-	-	-	-	-	126	126	-	28	28	-
Stage 2	-	-	-	-	-	-	39	28	-	125	132	-
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	1585	-	-	1542	-	-	800	738	1011	814	732	1046
Stage 1	-	-	-	-	-	-	878	792	-	989	872	-
Stage 2	-	-	-	-	-	-	976	872	-	879	787	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1584	-	-	1542	-	-	768	720	1010	799	714	1044
Mov Cap-2 Maneuver	-	-	-	-	-	-	768	720	-	799	714	-
Stage 1	-	-	-	-	-	-	857	773	-	965	871	-
Stage 2	-	-	-	-	-	-	955	871	-	859	768	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.7	0	9.7	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	768	1584	-	-	1542	-	-	1044
HCM Lane V/C Ratio	0.004	0.022	-	-	-	-	-	0.021
HCM Control Delay (s)	9.7	7.3	0	-	0	-	-	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	6	33	59	7	99
Future Vol, veh/h	122	6	33	59	7	99
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	3
Mvmt Flow	133	7	36	64	8	108

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	139	0	272	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	136	-
Critical Hdwy	-	-	4.12	-	6.42	6.23
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.327
Pot Cap-1 Maneuver	-	-	1445	-	717	910
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	890	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1445	-	698	910
Mov Cap-2 Maneuver	-	-	-	-	698	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	867	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	892	-	-	1445	-
HCM Lane V/C Ratio	0.129	-	-	0.025	-
HCM Control Delay (s)	9.6	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

HCS 2010: Freeway Merge and Diverge Segments Release 6.70

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative + Project PM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 4 - Pesante Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4475	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	105	vph
Length of first accel/decel lane	295	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4475	105		vph
Peak-hour factor, PHF	0.98	0.98		
Peak 15-min volume, v15	1142	27		v
Trucks and buses	9	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.957	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4772	109	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4772 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4881	4700	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4772 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	4881	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 41.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 0.808

Space mean speed in ramp influence area, S_R = 46.4 mph

Space mean speed in outer lanes, S = N/A mph

Space mean speed for all vehicles, S = 46.4 mph

Movement	EBL	EBR	EBR2	NBL	NBT	NBR	SBL	SBT	SBR	NWL2	NWL	NWR
Lane Configurations												
Traffic Volume (veh/h)	60	131	79	71	22	55	10	25	18	170	53	17
Future Volume (veh/h)	60	131	79	71	22	55	10	25	18	170	53	17
Number	1	16	16	7	4	14	3	8	18	5	5	12
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	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
Adj Sat Flow, veh/h/ln	1845	1845	1845	1827	1900	1900	1900	1884	1900	1810	1810	1900
Adj Flow Rate, veh/h	65	85	85	76	24	59	11	27	19	183	183	18
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	4	0	0	0	0	0	5	5	8
Cap, veh/h	118	274	274	195	55	135	88	50	35	245	245	107
Arrive On Green	0.07	0.17	0.17	0.11	0.11	0.11	0.05	0.05	0.05	0.14	0.14	0.26
Sat Flow, veh/h	1757	1568	1568	1740	488	1200	1810	1031	725	1723	1723	412
Grp Volume(v), veh/h	65	85	85	76	0	83	11	0	46	183	183	75
Grp Sat Flow(s),veh/h/ln	1757	1568	1568	1740	0	1688	1810	0	1756	1723	1723	1718
Q Serve(g_s), s	1.3	1.7	1.7	1.4	0.0	1.6	0.2	0.0	0.9	3.6	3.6	1.2
Cycle Q Clear(g_c), s	1.3	1.7	1.7	1.4	0.0	1.6	0.2	0.0	0.9	3.6	3.6	1.2
Prop In Lane	1.00	1.00	1.00	1.00		0.71	1.00		0.41	1.00	1.00	0.24
Lane Grp Cap(c), veh/h	118	274	274	195	0	190	88	0	85	245	245	444
V/C Ratio(X)	0.55	0.31	0.31	0.39	0.00	0.44	0.13	0.00	0.54	0.75	0.75	0.17
Avail Cap(c_a), veh/h	316	904	904	1261	0	1223	1425	0	1383	1401	1401	2093
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.8	12.6	12.6	14.4	0.0	14.5	16.0	0.0	16.3	14.4	14.4	10.1
Incr Delay (d2), s/veh	1.5	1.3	1.3	0.5	0.0	0.6	0.2	0.0	2.0	1.7	1.7	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	0.8	0.8	0.7	0.0	0.8	0.1	0.0	0.5	1.8	1.8	0.6
LnGrp Delay(d),s/veh	17.4	13.9	13.9	14.9	0.0	15.1	16.2	0.0	18.2	16.1	16.1	10.4
LnGrp LOS	B	B	B	B		B	B		B	B	B	B
Approach Vol, veh/h	291				159			57		258	258	
Approach Delay, s/veh	15.1				15.0			17.8		14.5	14.5	
Approach LOS	B				B			B		B	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.5	13.9		8.5	9.5	10.9		6.1
Change Period (Y+Rc), s	* 4.2	4.8		* 4.6	4.5	4.8		4.4
Max Green Setting (Gmax), s	* 6.3	42.7		* 25	28.5	20.2		27.6
Max Q Clear Time (g_c+I1), s	3.3	3.2		3.6	5.6	4.4		2.9
Green Ext Time (p_c), s	0.0	2.2		0.2	0.1	1.7		0.1

Intersection Summary			
HCM 2010 Ctrl Delay		15.1	
HCM 2010 LOS		B	

Notes

HCS 2010: Freeway Merge and Diverge Segments Release 6.70

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative + Project PM
Freeway/Dir of Travel:	US 101 / Southbound
Junction:	Intersection 6 - Blackie Road
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4547	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	196	vph
Length of first accel/decel lane	750	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4547	196		vph
Peak-hour factor, PHF	0.96	0.96		
Peak 15-min volume, v15	1184	51		v
Trucks and buses	7	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.966	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4902	208	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4902 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5110	4700	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4902 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	5110	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 40.5 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable,	M_S = 0.900	
Space mean speed in ramp influence area,	S_R = 44.3	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 44.3	mph

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	79	7	115	177	24	92
Future Vol, veh/h	79	7	115	177	24	92
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	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	1	0	4
Mvmt Flow	86	8	125	192	26	100

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	373	221	0	0	317	0
Stage 1	221	-	-	-	-	-
Stage 2	152	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	632	824	-	-	1255	-
Stage 1	821	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	618	824	-	-	1255	-
Mov Cap-2 Maneuver	618	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	862	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	1.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	631	1255	-
HCM Lane V/C Ratio	-	-	0.148	0.021	-
HCM Control Delay (s)	-	-	11.7	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection

Int Delay, s/veh 5.4

Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	21	64	44	127	228	46
Future Vol, veh/h	21	64	44	127	228	46
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	-	-	160	0	50
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	3	2	6
Mvmt Flow	23	70	48	138	248	50

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	48	0	-	0	48	48
Stage 1	-	-	-	-	48	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.1	-	-	-	6.42	6.26
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.354
Pot Cap-1 Maneuver	1572	-	-	-	962	1010
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1572	-	-	-	948	1010
Mov Cap-2 Maneuver	-	-	-	-	948	-
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	-	-

Approach	NB	SB	NE
HCM Control Delay, s	1.8	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	948	1010	1572	-	-	-
HCM Lane V/C Ratio	0.261	0.05	0.015	-	-	-
HCM Control Delay (s)	10.1	8.8	7.3	-	-	-
HCM Lane LOS	B	A	A	-	-	-
HCM 95th %tile Q(veh)	1	0.2	0	-	-	-

Intersection

Int Delay, s/veh 3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	88	56	13	51	2	30	11	37	3	9	8
Future Vol, veh/h	10	88	56	13	51	2	30	11	37	3	9	8
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	1	0	1
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	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	0	6	1	2	6	2	2	2	4	50	0	6
Mvmt Flow	12	109	69	16	63	2	37	14	46	4	11	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	66	0	0	178	0	0	276	267	144	296	299	66
Stage 1	-	-	-	-	-	-	168	168	-	97	97	-
Stage 2	-	-	-	-	-	-	108	99	-	199	202	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.12	6.52	6.24	7.6	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.6	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.518	4.018	3.336	3.95	4	3.354
Pot Cap-1 Maneuver	1549	-	-	1398	-	-	676	639	898	571	616	987
Stage 1	-	-	-	-	-	-	834	759	-	804	819	-
Stage 2	-	-	-	-	-	-	897	813	-	704	738	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1548	-	-	1397	-	-	649	625	897	524	603	985
Mov Cap-2 Maneuver	-	-	-	-	-	-	649	625	-	524	603	-
Stage 1	-	-	-	-	-	-	826	752	-	796	808	-
Stage 2	-	-	-	-	-	-	865	803	-	650	731	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.5	10.6	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	742	1548	-	-	1397	-	-	695
HCM Lane V/C Ratio	0.13	0.008	-	-	0.011	-	-	0.036
HCM Control Delay (s)	10.6	7.3	0	-	7.6	0	-	10.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	JO
Agency/Co.:	MM
Date performed:	8/24/17
Analysis time period:	Cumulative + Project PM
Freeway/Dir of Travel:	US 101 / Northbound
Junction:	Intersection 10 - Reese Circle
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	4480	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	122	vph
Length of first accel/decel lane	740	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	89	vph
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	740	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4480	122	89	vph
Peak-hour factor, PHF	0.95	0.95	0.98	
Peak 15-min volume, v15	1179	32	23	v
Trucks and buses	6	4	1	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.971	0.980	0.995	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4857	131	91	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4857 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4988	4700	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4857 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

v_{R12}	4988	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 39.7 pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, M_S = 0.826

Space mean speed in ramp influence area, S_R = 46.0 mph

Space mean speed in outer lanes, S = N/A mph

Space mean speed for all vehicles, S = 46.0 mph

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	82	106	13	0	32	7	3	1	0	0	0	51
Future Vol, veh/h	82	106	13	0	32	7	3	1	0	0	0	51
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	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	3	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	87	113	14	0	34	7	3	1	0	0	0	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	41	0	0	127	0	0	359	335	120	333	339	38
Stage 1	-	-	-	-	-	-	294	294	-	38	38	-
Stage 2	-	-	-	-	-	-	65	41	-	295	301	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1581	-	-	1472	-	-	600	589	937	624	586	1040
Stage 1	-	-	-	-	-	-	719	673	-	982	867	-
Stage 2	-	-	-	-	-	-	951	865	-	718	669	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1581	-	-	1472	-	-	543	554	937	595	551	1040
Mov Cap-2 Maneuver	-	-	-	-	-	-	543	554	-	595	551	-
Stage 1	-	-	-	-	-	-	677	633	-	924	867	-
Stage 2	-	-	-	-	-	-	901	865	-	675	630	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3	0	11.6	8.7
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	546	1581	-	-	1472	-	-	1040
HCM Lane V/C Ratio	0.008	0.055	-	-	-	-	-	0.052
HCM Control Delay (s)	11.6	7.4	0	-	0	-	-	8.7
HCM Lane LOS	B	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	0.2

Appendix C-2

Road Segment Level of Service Calculations

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2063	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	579	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1229	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	4.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	11.4	mi/h
Free-flow speed, FFS	64.0	mi/h

LOS and Performance Measures

Flow rate, vp	1229	pc/h/ln
Free-flow speed, FFS	64.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	18.9	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2575	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	723	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1519	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	3.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	8.1	mi/h
Free-flow speed, FFS	67.3	mi/h

LOS and Performance Measures

Flow rate, vp	1519	pc/h/ln
Free-flow speed, FFS	67.3	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	2	
Density, D	23.4	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2678	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	728	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	1521	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	4.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	11.4	mi/h
Free-flow speed, FFS	64.0	mi/h

LOS and Performance Measures

Flow rate, vp	1521	pc/h/ln
Free-flow speed, FFS	64.0	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	2	
Density, D	23.5	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	3114	veh/h
Peak-hour factor, PHF	0.99	
Peak 15-min volume, v15	786	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	1643	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	3.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	8.1	mi/h
Free-flow speed, FFS	67.3	mi/h

LOS and Performance Measures

Flow rate, vp	1643	pc/h/ln
Free-flow speed, FFS	67.3	mi/h
Average passenger-car speed, S	64.2	mi/h
Number of lanes, N	2	
Density, D	25.6	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2068	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	581	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	1232	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	4.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	11.4	mi/h
Free-flow speed, FFS	64.0	mi/h

LOS and Performance Measures

Flow rate, vp	1232	pc/h/ln
Free-flow speed, FFS	64.0	mi/h
Average passenger-car speed, S	65.0	mi/h
Number of lanes, N	2	
Density, D	19.0	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2577	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	724	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1520	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	3.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	8.1	mi/h
Free-flow speed, FFS	67.3	mi/h

LOS and Performance Measures

Flow rate, vp	1520	pc/h/ln
Free-flow speed, FFS	67.3	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	2	
Density, D	23.5	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2682	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	729	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	1523	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	4.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	11.4	mi/h
Free-flow speed, FFS	64.0	mi/h

LOS and Performance Measures

Flow rate, vp	1523	pc/h/ln
Free-flow speed, FFS	64.0	mi/h
Average passenger-car speed, S	64.8	mi/h
Number of lanes, N	2	
Density, D	23.5	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	3120	veh/h
Peak-hour factor, PHF	0.99	
Peak 15-min volume, v15	788	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	1647	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	3.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	8.1	mi/h
Free-flow speed, FFS	67.3	mi/h

LOS and Performance Measures

Flow rate, vp	1647	pc/h/ln
Free-flow speed, FFS	67.3	mi/h
Average passenger-car speed, S	64.1	mi/h
Number of lanes, N	2	
Density, D	25.7	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	3569	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1003	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	2125	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	4.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	11.4	mi/h
Free-flow speed, FFS	64.0	mi/h

LOS and Performance Measures

Flow rate, vp	2125	pc/h/ln
Free-flow speed, FFS	64.0	mi/h
Average passenger-car speed, S	57.5	mi/h
Number of lanes, N	2	
Density, D	36.9	pc/mi/ln
	E	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4254	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1195	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2509	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	3.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	8.1	mi/h
Free-flow speed, FFS	67.3	mi/h

LOS and Performance Measures

Flow rate, vp	2509	pc/h/ln
Free-flow speed, FFS	67.3	mi/h
Average passenger-car speed, S	47.6	mi/h
Number of lanes, N	2	
Density, D	52.8	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4576	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1243	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2599	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	4.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	11.4	mi/h
Free-flow speed, FFS	64.0	mi/h

LOS and Performance Measures

Flow rate, vp	2599	pc/h/ln
Free-flow speed, FFS	64.0	mi/h
Average passenger-car speed, S	44.6	mi/h
Number of lanes, N	2	
Density, D	58.3	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4751	veh/h
Peak-hour factor, PHF	0.99	
Peak 15-min volume, v15	1200	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2507	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	3.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	8.1	mi/h
Free-flow speed, FFS	67.3	mi/h

LOS and Performance Measures

Flow rate, vp	2507	pc/h/ln
Free-flow speed, FFS	67.3	mi/h
Average passenger-car speed, S	47.6	mi/h
Number of lanes, N	2	
Density, D	52.6	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	3574	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1004	v
Trucks and buses	12	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.943	
Driver population factor, fp	1.00	
Flow rate, vp	2128	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	4.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	11.4	mi/h
Free-flow speed, FFS	64.0	mi/h

LOS and Performance Measures

Flow rate, vp	2128	pc/h/ln
Free-flow speed, FFS	64.0	mi/h
Average passenger-car speed, S	57.5	mi/h
Number of lanes, N	2	
Density, D	37.0	pc/mi/ln
	E	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4256	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	1196	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2511	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	3.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	8.1	mi/h
Free-flow speed, FFS	67.3	mi/h

LOS and Performance Measures

Flow rate, vp	2511	pc/h/ln
Free-flow speed, FFS	67.3	mi/h
Average passenger-car speed, S	47.5	mi/h
Number of lanes, N	2	
Density, D	52.9	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4580	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1245	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2601	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	4.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	11.4	mi/h
Free-flow speed, FFS	64.0	mi/h

LOS and Performance Measures

Flow rate, vp	2601	pc/h/ln
Free-flow speed, FFS	64.0	mi/h
Average passenger-car speed, S	44.5	mi/h
Number of lanes, N	2	
Density, D	58.4	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #1 - SR 156 / Pesante
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4757	veh/h
Peak-hour factor, PHF	0.99	
Peak 15-min volume, v15	1201	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2511	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	3.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	8.1	mi/h
Free-flow speed, FFS	67.3	mi/h

LOS and Performance Measures

Flow rate, vp	2511	pc/h/ln
Free-flow speed, FFS	67.3	mi/h
Average passenger-car speed, S	47.5	mi/h
Number of lanes, N	2	
Density, D	52.9	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2011	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	565	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1186	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	1186	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.9	pc/mi/ln
	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2576	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	671	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	1402	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	1402	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	69.5	mi/h
Number of lanes, N	2	
Density, D	20.2	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2691	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	701	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	1451	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	1451	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	69.3	mi/h
Number of lanes, N	2	
Density, D	20.9	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	3144	veh/h
Peak-hour factor, PHF	0.99	
Peak 15-min volume, v15	794	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	1659	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	1659	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	67.6	mi/h
Number of lanes, N	2	
Density, D	24.6	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2013	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	565	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1187	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	1187	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	17.0	pc/mi/ln
	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2578	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	671	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	1403	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	1403	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	69.5	mi/h
Number of lanes, N	2	
Density, D	20.2	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2697	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	702	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	1454	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	1454	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	69.3	mi/h
Number of lanes, N	2	
Density, D	21.0	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	3150	veh/h
Peak-hour factor, PHF	0.99	
Peak 15-min volume, v15	795	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	1662	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	1662	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	67.5	mi/h
Number of lanes, N	2	
Density, D	24.6	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	3494	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	981	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2061	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	2061	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	61.4	mi/h
Number of lanes, N	2	
Density, D	33.6	pc/mi/ln
	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4255	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	1108	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2316	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	2316	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	55.6	mi/h
Number of lanes, N	2	
Density, D	41.7	pc/mi/ln
	E	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4597	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	1197	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	2478	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	2478	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	51.1	mi/h
Number of lanes, N	2	
Density, D	48.5	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4781	veh/h
Peak-hour factor, PHF	0.99	
Peak 15-min volume, v15	1207	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2523	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	2523	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	49.7	mi/h
Number of lanes, N	2	
Density, D	50.8	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	3496	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	982	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2062	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	2062	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	61.4	mi/h
Number of lanes, N	2	
Density, D	33.6	pc/mi/ln
	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4257	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	1109	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2317	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	2317	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	55.5	mi/h
Number of lanes, N	2	
Density, D	41.7	pc/mi/ln
	E	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4602	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	1198	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	2481	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	2481	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	51.0	mi/h
Number of lanes, N	2	
Density, D	48.7	pc/mi/ln
	F	

Phone: Fax:
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Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #2 - Pesante/Sala
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4787	veh/h
Peak-hour factor, PHF	0.99	
Peak 15-min volume, v15	1209	v
Trucks and buses	9	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.957	
Driver population factor, fp	1.00	
Flow rate, vp	2526	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	2.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	5.8	mi/h
Free-flow speed, FFS	69.6	mi/h

LOS and Performance Measures

Flow rate, vp	2526	pc/h/ln
Free-flow speed, FFS	69.6	mi/h
Average passenger-car speed, S	49.6	mi/h
Number of lanes, N	2	
Density, D	50.9	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	1913	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	537	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1128	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1128	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	2	
Density, D	15.1	pc/mi/ln
	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2603	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	707	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1485	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1485	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	72.4	mi/h
Number of lanes, N	2	
Density, D	20.5	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2737	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	713	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	1475	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1475	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	72.5	mi/h
Number of lanes, N	2	
Density, D	20.3	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2981	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	801	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	1659	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1659	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	70.2	mi/h
Number of lanes, N	2	
Density, D	23.6	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	1915	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	538	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1130	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1130	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	2	
Density, D	15.1	pc/mi/ln
	B	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2607	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	708	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1488	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1488	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	72.4	mi/h
Number of lanes, N	2	
Density, D	20.6	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2743	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	714	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	1479	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1479	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	72.5	mi/h
Number of lanes, N	2	
Density, D	20.4	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Existing + Project PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	2984	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	802	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	1660	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1660	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	70.2	mi/h
Number of lanes, N	2	
Density, D	23.7	pc/mi/ln
	C	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	3390	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	952	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2000	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2000	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	63.9	mi/h
Number of lanes, N	2	
Density, D	31.3	pc/mi/ln
	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4286	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1165	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2446	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2446	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	51.9	mi/h
Number of lanes, N	2	
Density, D	47.2	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4654	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	1212	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	2509	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2509	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	49.8	mi/h
Number of lanes, N	2	
Density, D	50.4	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4595	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1235	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	2557	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2557	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	48.2	mi/h
Number of lanes, N	2	
Density, D	53.1	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project AM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	3392	veh/h
Peak-hour factor, PHF	0.89	
Peak 15-min volume, v15	953	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2001	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2001	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	63.9	mi/h
Number of lanes, N	2	
Density, D	31.3	pc/mi/ln
	D	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project AM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4290	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1166	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2448	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2448	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	51.8	mi/h
Number of lanes, N	2	
Density, D	47.3	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project PM
Freeway/Direction:	US 101 / Northbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4659	veh/h
Peak-hour factor, PHF	0.96	
Peak 15-min volume, v15	1213	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	2511	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2511	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	49.7	mi/h
Number of lanes, N	2	
Density, D	50.5	pc/mi/ln
	F	

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	JO
Agency or Company:	Mott MacDonald
Date Performed:	8/24/17
Analysis Time Period:	Cumulative + Project PM
Freeway/Direction:	US 101 / Southbound
From/To:	Segment #3 - Sala/Boronda
Jurisdiction:	Monterey County
Analysis Year:	2017
Description:	LaTourette Subdivision

Flow Inputs and Adjustments

Volume, V	4598	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1236	v
Trucks and buses	7	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.966	
Driver population factor, fp	1.00	
Flow rate, vp	2559	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

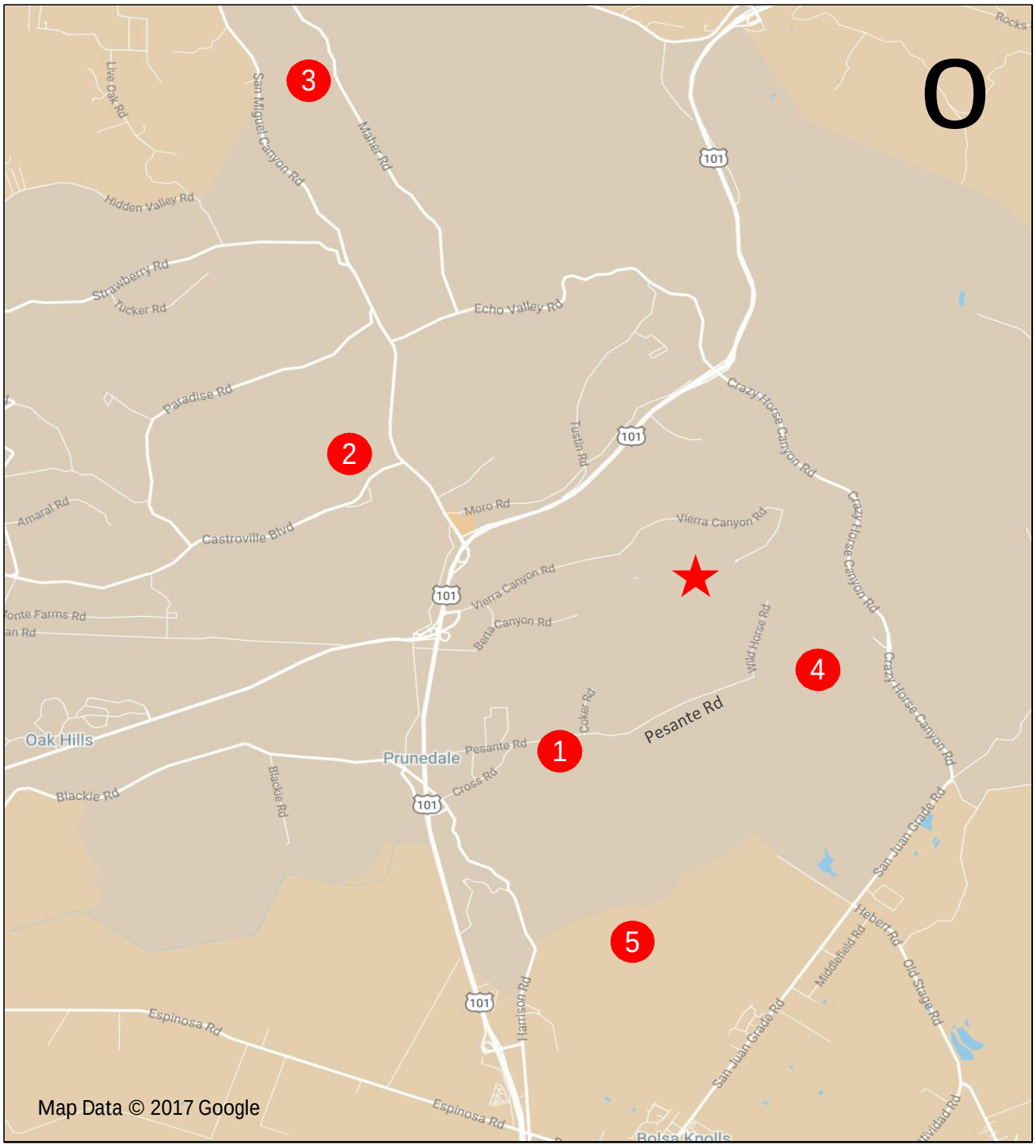
Flow rate, vp	2559	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	48.1	mi/h
Number of lanes, N	2	
Density, D	53.2	pc/mi/ln
	F	

Appendix D

Cumulative Projects Location Map

Appendix D

Cumulative Projects Location Map



LEGEND

★ Proposed Project Location

X Cumulative Projects

Appendices E to K

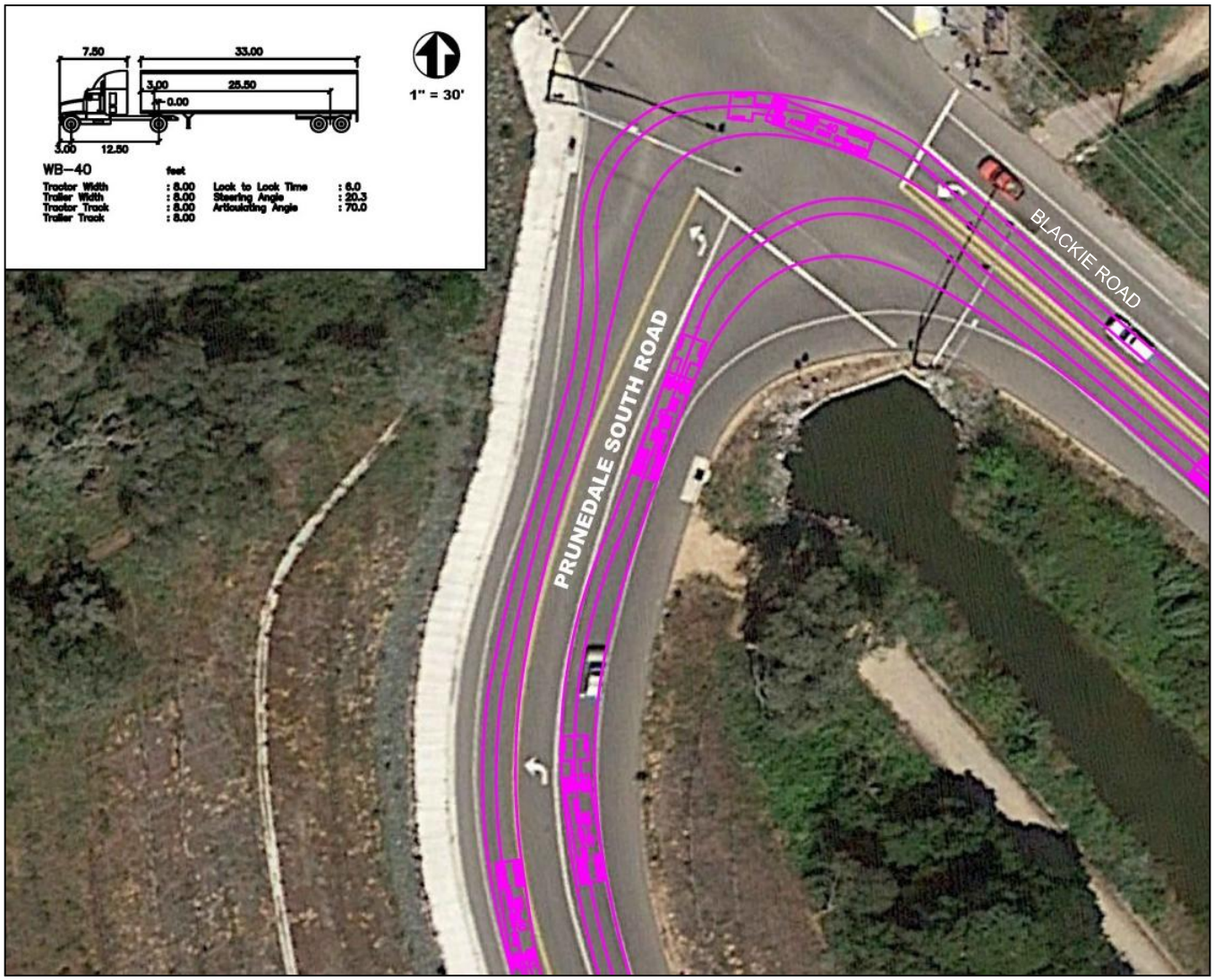
Blackie Road Intersections Geometric Analysis

Appendix E

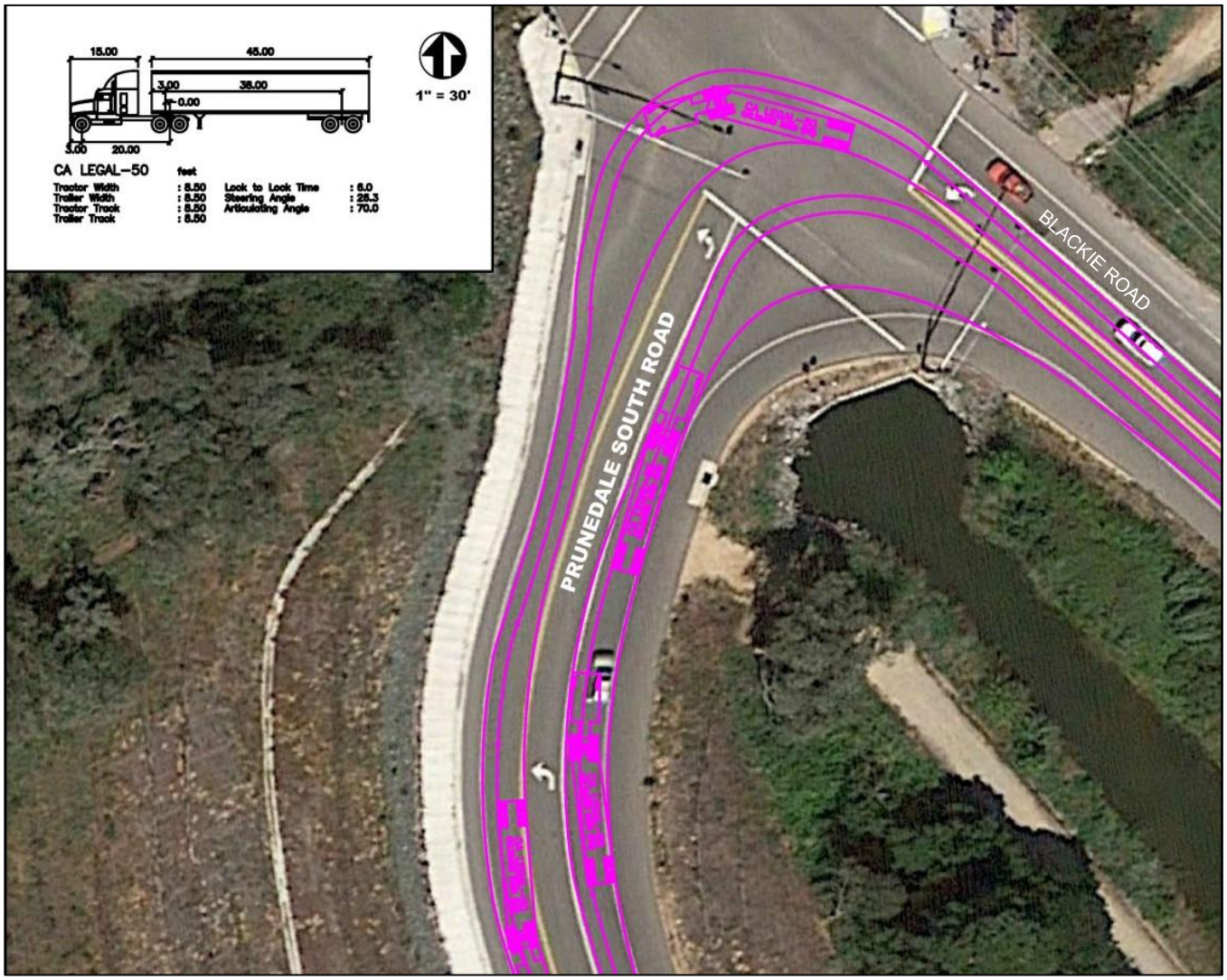
Blackie Road Intersection Alignments



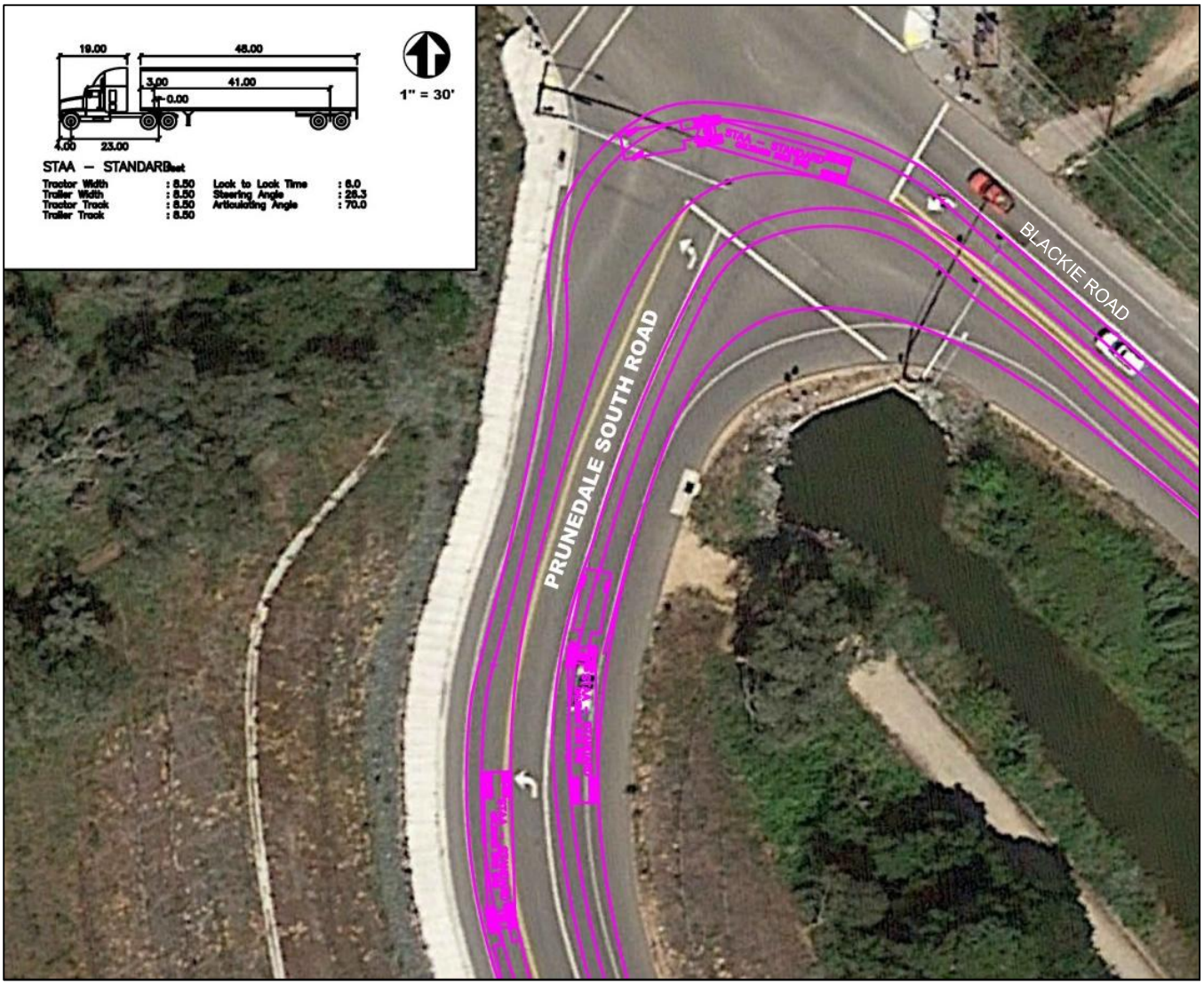
Appendix F: Prunedale South Rd / Blackie Road WB-40 Truck Turning Template



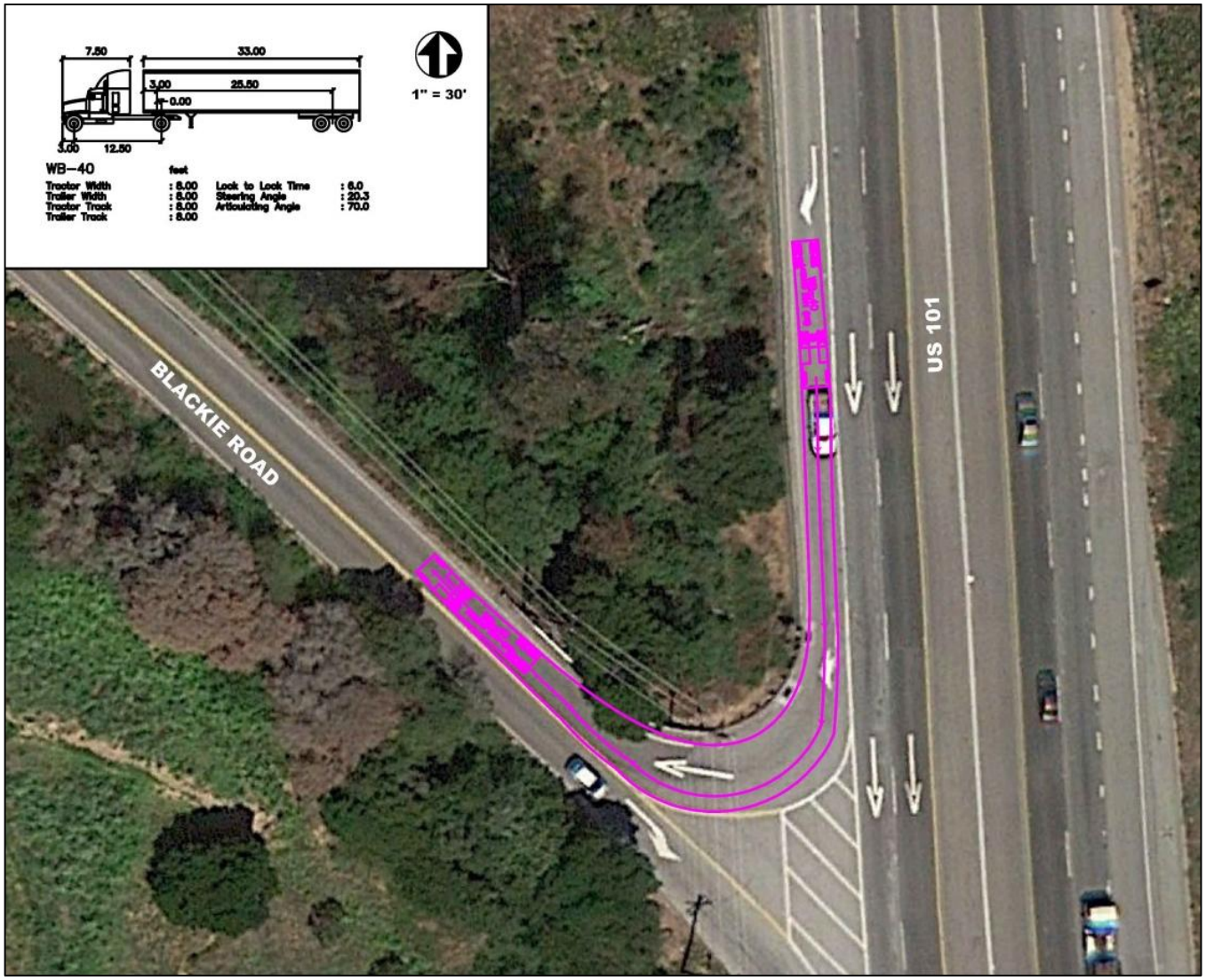
Appendix G: Prunedale South Rd / Blackie Road CA Legal-50 Truck Turning Template



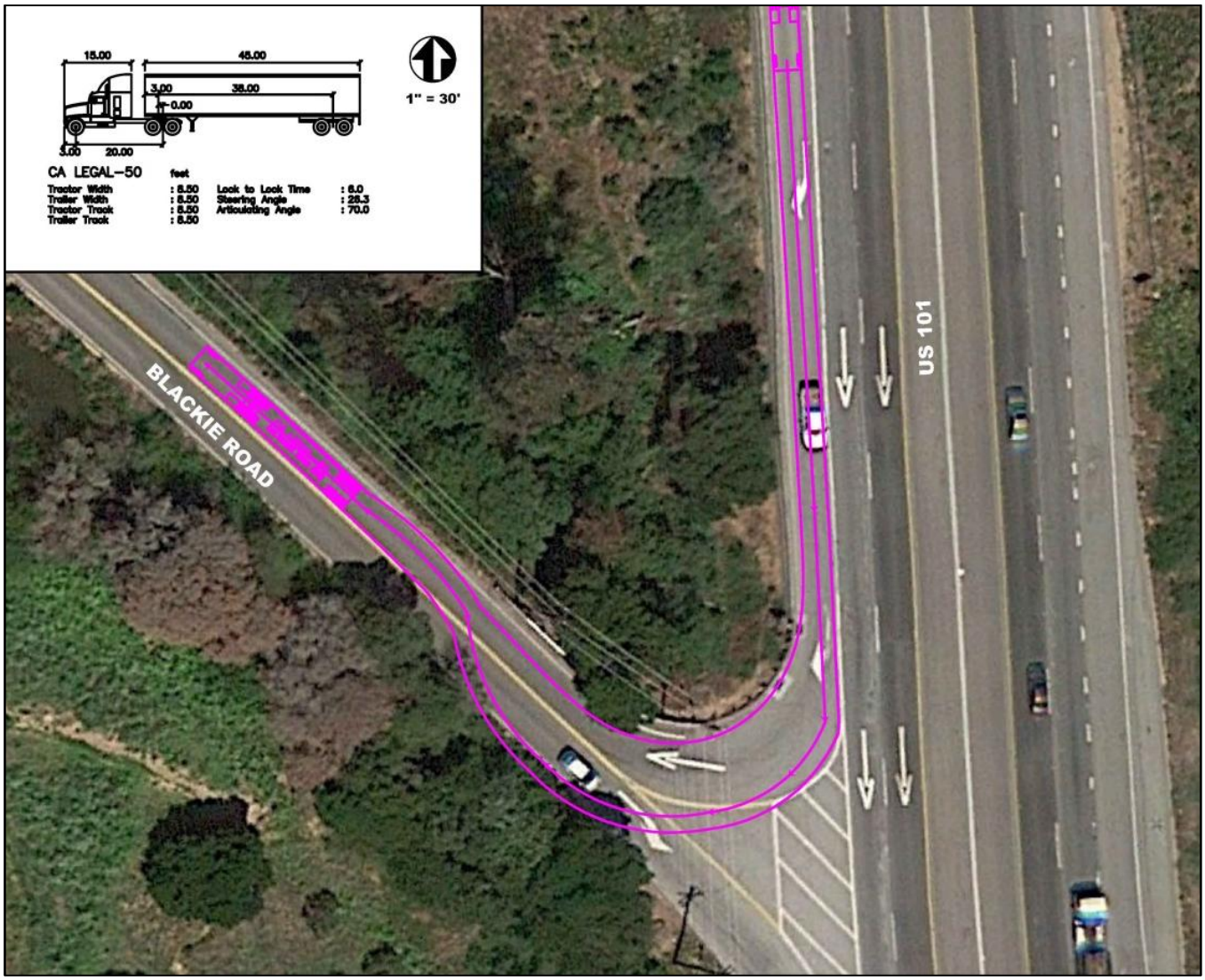
Appendix H: Prunedale South Rd / Blackie Road STAA Standard Truck Turning Template



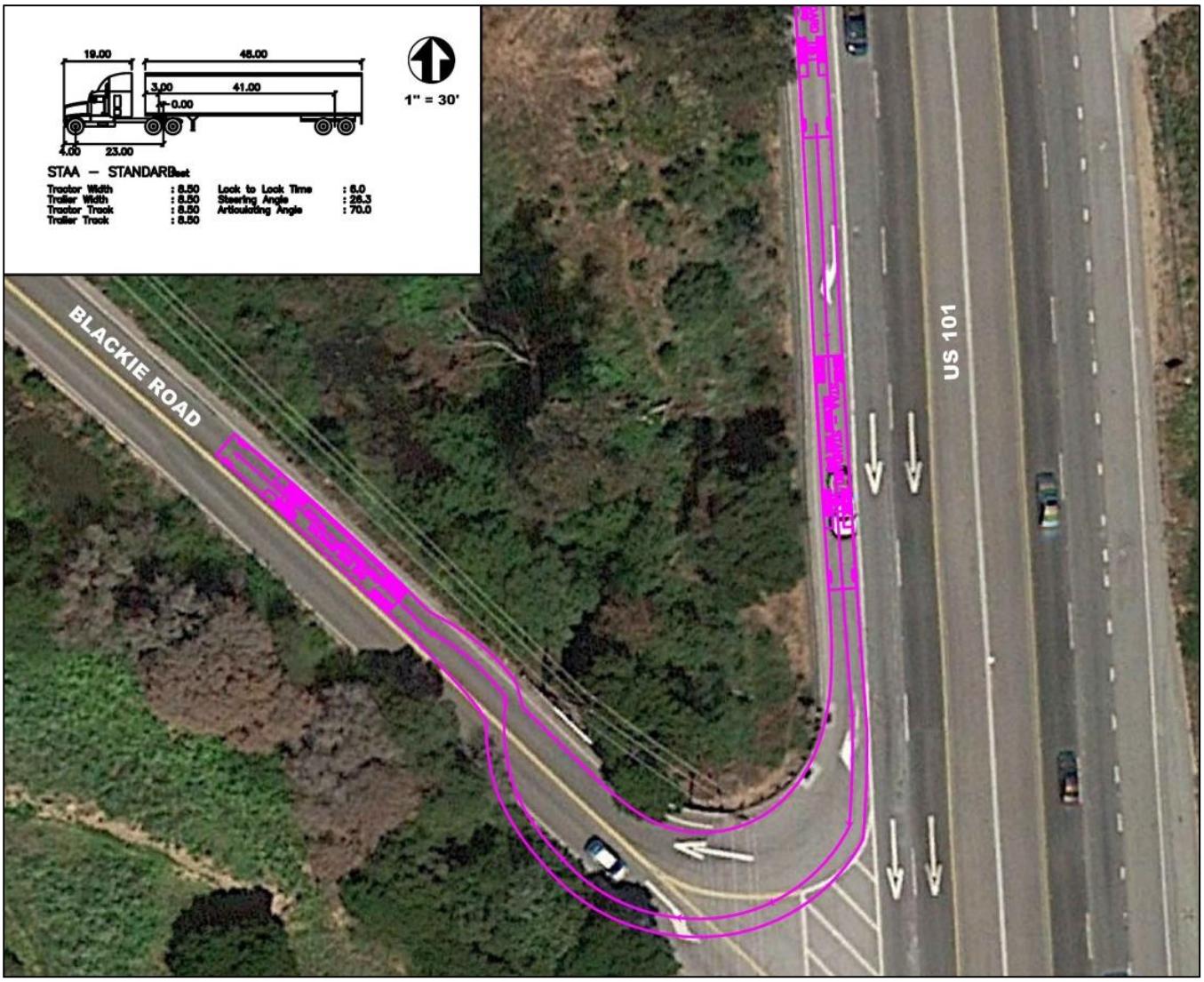
Appendix I: Highway 101 / Blackie Road WB-40 Truck Turning Template



Appendix J: Highway 101 / Blackie Road CA Legal-50 Truck Turning Template



Appendix K: Highway 101 / Blackie Road STAA Standard Truck Turning Template



Appendix M

VMT Study

Keith Higgins
Traffic Engineer

December 23, 2021

Dale Ellis
Anthony Lombardo & Associates
A Professional Corporation
144 West Gabilan
Salinas, CA 93901

Re: Proposal for LaTourette Subdivision Traffic Impact Analysis, Monterey County, CA

Dear Dale,

This letter is a Vehicle Miles Traveled analysis (VMT Analysis) for the LaTourette Subdivision project (Project) located north of Pesante Road on North King Road in North Monterey County, California. The LaTourette Subdivision is proposed to include a total of 19-unit (single-family homes) residential subdivision, which is the project description analyzed in "LaTourette Subdivision Traffic Impact Analysis – Draft Report," Keith Higgins, traffic engineer, October 4, 2017 (2017 TIA). Two of the proposed lots (Lots 11 and 16) are already occupied by homes, one of which (proposed Lot 16) has two housing units for a total of three existing units. The Project thus would result in a net increase of 17 homes.

Due to septic disposal limitations, the reduced project alternative includes a gross total of 17 lots. Again, two lots already are developed with existing homes. The reduced project alternative would therefore result in a net increase of 15 undeveloped lots, or 15 homes.

This letter provides a summary of the 2017 TIA conclusions and recommendations as well as the VMT analysis to comply with the most recent California Environmental Quality Act (CEQA) Guidelines, which are described below.

A. 2017 TIA Summary

The 2017 TIA determined that the 19-unit project would result in no off-site traffic effects that would require off-site improvements. The recommendations included providing an entrance road that would conform to the Monterey County Tertiary Rural Sidehill Road standard. It is also suggested that the Project install a stop sign and direction arrow warning signs at the North King Road approach to Pesante Road as directed by the Monterey County Public Works Department. The Project will also be required to pay the Monterey County and TAMC development impact fees as well as the Pesante Road Corridor Fee to fund the existing Country Meadows Drive Extension. These recommendations and conditions will still apply.

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B. VMT Analysis

1. VMT Policy Background

SB 743, which was signed into law in 2013 and codified in Public Resources Code 21099, tasked the State Office of Planning and Research (OPR) with establishing new criteria for determining the significance of transportation impacts under CEQA. SB 743 requires the new criteria to "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." SB 743 changes the way that public agencies evaluate the transportation impacts of projects under CEQA, recognizing that roadway congestion, while an inconvenience to drivers, is not itself an environmental impact (see Pub. Resource Code, § 21099, subdivision (b)(2)).

In addition to new exemptions for projects that are consistent with specific plans, SB 743 led to changes in California CEQA guidelines, released in December 2018 and described in new Section 15064.3 of the CEQA Guidelines that apply statewide as of July 1, 2020. The new CEQA guidelines replaces congestion-based metrics, such as auto delay and level of service, with Vehicle Miles Traveled (VMT) as the basis for determining significant impacts, unless the guidelines provide specific exceptions.

Each local agency is responsible for adopting their own policies, procedures, and guidelines to implement SB 743. The "Technical Advisory on Evaluating Transportation Impacts in CEQA," State of California Governor's Office of Planning and Research, December 2018, (OPR Guidelines) was published to provide a suggested framework for local agencies to follow in establishing their individual programs. The OPR Guidelines can modified by each local agency, subject to providing substantial evidence for any variations. Monterey has not yet established a VMT standard and significance criteria for VMT evaluations in the unincorporated areas of the county. A major issue in establishing these standards is quantifying an equitable standard between the agricultural areas, rural/low density areas and the more urbanized areas. However, although a draft has been recommended for approval by the Monterey County Planning Commission, it has not been adopted by the Board of Supervisors at this time. There is apparently no schedule for its adoption. In the meantime, the County is using the OPR Guidelines for evaluating Project VMT impacts as a part of its CEQA review.

2. VMT Analysis

According to "Section 1 - Screening Thresholds for Land Use Projects," OPR Guidelines page 12, "projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact." To determine if the Project will generate traffic that will fall below this threshold, a trip generation study was conducted of comparable developments in the immediate vicinity of the Project. This included the Woodland Heights and Moonglow Subdivisions, both of which are located on North King Road which is the access road for the Project. These subdivisions are the same parcel size, total unit count and housing type as the Project. In addition to being located adjacent to the Project, their trip characteristics have essentially identical socio-economic and geographic characteristics of the Project and are the best comparables for estimating Project trip generation. A map location map of the Project and these subdivisions is included as **Exhibit 1**.

Exhibit 2 provides a tabular summary of the trips counted at both of these subdivisions. The raw traffic count data is included in **Appendix A**. The Woodland Heights subdivision generated an average of 7.50 trips per day per home. The Moonglow subdivision generated an average of 8.32 trips per day per home. The weighted average of the two subdivisions is 7.81 trips per day per home. This is about 17% less than the standard daily trip rate of 9.44 in "Trip Generation Manual," Institute of Transportation Engineers, 10th Edition, 2017 and the daily rate of 9.43 in the "Trip Generation Manual," Institute of Transportation Engineers (ITE), 11th Edition, 2021. However, it is well within the range of 4.45 to 22.61 daily trips per unit in the ITE database that includes 174 existing housing developments throughout the United States from which the average rate is derived.

Exhibit 2 also indicates that the proposed 17 new homes will generate a total of about 133 daily trips based on the trip generation rate of 7.81 per home. This is 23 trips more than the 110 daily trip significance threshold. The Project would have a significant VMT impact.

3. Reduced Project due to Septic Limitations

Percolation tests at the Project site indicate that septic capacity is limited and that two homesites must be eliminated, which would result in 15 new homes. Assuming each home generates about 7.81 trips per day, the reduced Project would generate a total of 117 daily trips, which is 7 trips per day above the significance threshold of 110 daily trips. The reduced Project would result in a significant transportation impact.

4. Proposed Project Modification and Conclusion

In order to limit Project traffic to less than the significance threshold, the Project is now proposing to eliminate one of the two existing residential units on proposed Lot 16, which would also eliminate 7.81 (rounded to 8) daily trips from the Project site. The Project proponent will accept a condition of approval requiring that at such time as one of the units on proposed lot 16 is vacant, or prior to recording the final map, whichever is later, that housing unit will be removed from the property. The Project would then result in a net increase of 109 daily trips. This is below the 110 daily trips threshold, resulting in the Project having a less-than-significant VMT impact. No additional VMT analysis is required.

If you have any questions regarding the contents of this proposal or need additional information, please do not hesitate to contact me at your convenience. Thank you for the opportunity to assist you with this project.

Respectfully submitted,

Keith B. Higgins, PE, TE

enclosures

Exhibit 1

Project and Traffic Count Location Map

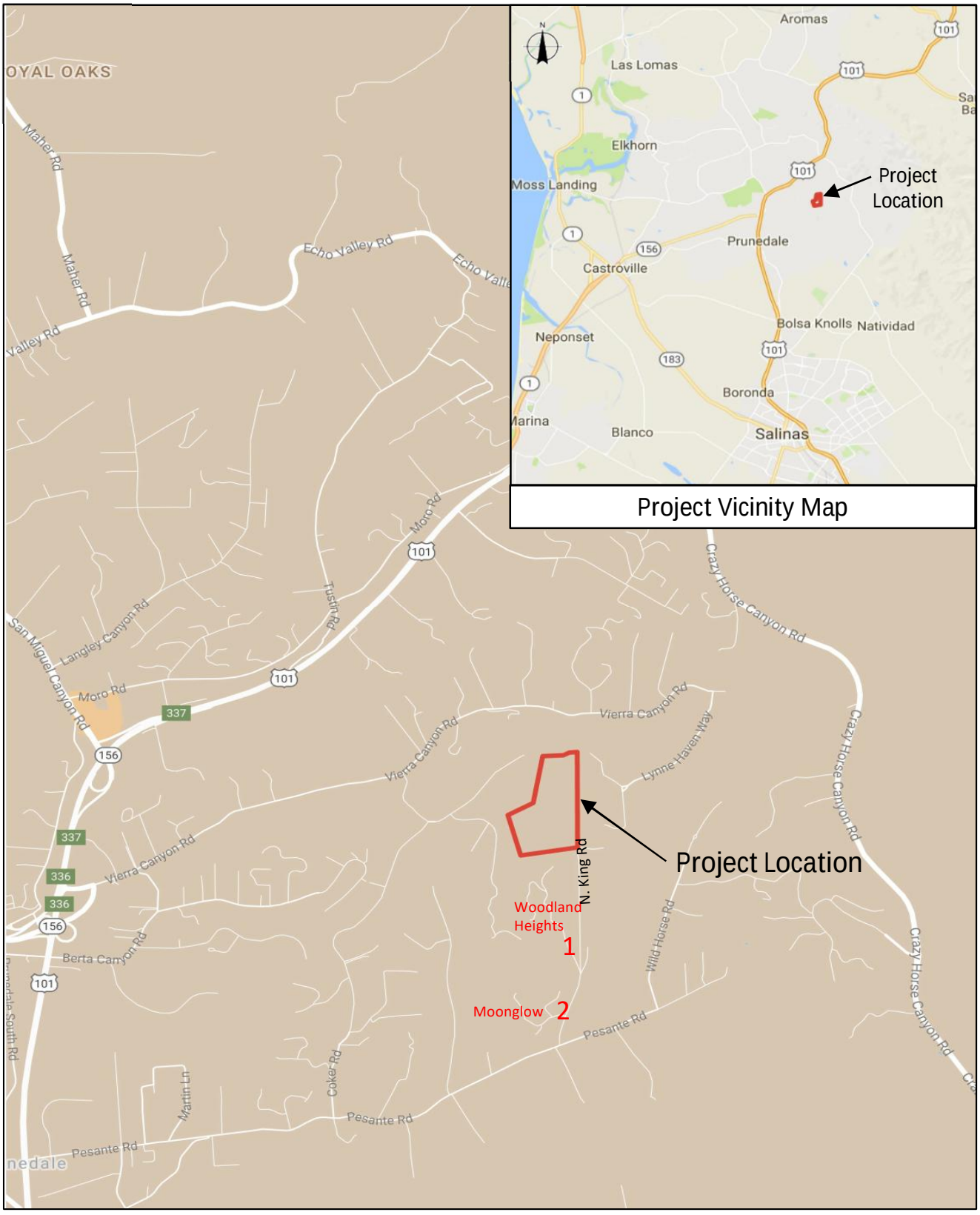

Exhibit 2
Pesante Road Single Family Residential Trip Generation Rates

Location	Wednesday 10/13/2021			Thursday 10/14/2021			Daily Mid-Week Average		
	In	Out	Total	In	Out	Total	In	Out	Total
Woodland Heights									
Trips	87	88	175	84	86	170	86	87	173
No. of Homes									23
Daily Trips per Home									7.50
Moonglow Road									
Trips	65	62	127	56	50	106	61	56	117
No. of Homes									14
Daily Trips per Home									8.32
TOTAL									
Trips	152	150	302	140	136	276	146	143	289
No. of Homes									37
Average Daily Trips per Home									7.81

Latourette Subdivision Trip Generation Estimate			
Daily Trips Based on Woodland Heights and Moonglow Subdivision Trip Rates			
Project Description	**Project Size (Units)**	**Daily Trip Rate**	**Daily Trip Increase**
A. Original Subdivision Proposal	19	**7.81**	
B. Minus Lots with Existing Development	2		
Original Potential New Home Sites	**17**	**7.81**	**133**
C. Minus Lots Removed due to Septic Capacity Limitations	2		
Net Potential New Home Sites with Septic Limitation	**15**	**7.81**	**117**
Screening Threshold for Impact Significance Determination			110
Elimination of One of Two Existing Homes on Lot 16	1	7.81	8
Net Project Daily Trips - Reduced Project Alternative with Elimination of One Existing Home			**109**

NOTE:

1. Source of Existing Subdivision traffic volumes: Tube counts conducted for Wednesday and Thursday, October 13 and 14, 2021 included in **Appendix A**.

Appendix A

Woodland Heights and Moonglow

Traffic Count Data

Location: Woodland Heights - N King Rd
Date Range: 10/12/2021 - 10/18/2021
Site Code: 01

	Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Mid-Week Average		
	10/12/2021			10/13/2021			10/14/2021			10/15/2021			10/16/2021			10/17/2021			10/18/2021					
Time	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	-	-	-	1	0	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
1:00 AM	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2:00 AM	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
3:00 AM	-	-	-	0	1	1	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
4:00 AM	-	-	-	0	2	2	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	0	2	2
5:00 AM	-	-	-	1	2	3	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2
6:00 AM	-	-	-	1	6	7	2	6	8	-	-	-	-	-	-	-	-	-	-	-	-	2	6	8
7:00 AM	-	-	-	3	8	11	6	**10**	**16**	-	-	-	-	-	-	-	-	-	-	-	-	5	**9**	**14**
8:00 AM	-	-	-	2	9	11	2	7	9	-	-	-	-	-	-	-	-	-	-	-	-	2	8	10
9:00 AM	-	-	-	**7**	5	12	**7**	4	11	-	-	-	-	-	-	-	-	-	-	-	-	**7**	5	12
10:00 AM	-	-	-	6	8	14	4	6	10	-	-	-	-	-	-	-	-	-	-	-	-	5	7	12
11:00 AM	-	-	-	5	**10**	**15**	4	6	10	-	-	-	-	-	-	-	-	-	-	-	-	5	8	13
12:00 PM	-	-	-	5	**9**	**14**	5	**9**	14	-	-	-	-	-	-	-	-	-	-	-	-	5	**9**	14
1:00 PM	-	-	-	7	3	10	8	7	15	-	-	-	-	-	-	-	-	-	-	-	-	8	5	13
2:00 PM	2	4	6	7	5	12	5	5	10	-	-	-	-	-	-	-	-	-	-	-	-	5	5	9
3:00 PM	8	1	9	**8**	2	10	6	3	9	-	-	-	-	-	-	-	-	-	-	-	-	7	2	9
4:00 PM	**11**	**9**	**20**	**8**	5	13	**12**	4	**16**	-	-	-	-	-	-	-	-	-	-	-	-	**10**	6	**16**
5:00 PM	10	8	18	7	5	12	6	8	14	-	-	-	-	-	-	-	-	-	-	-	-	8	7	15
6:00 PM	5	2	7	**8**	3	11	6	4	10	-	-	-	-	-	-	-	-	-	-	-	-	6	3	9
7:00 PM	7	1	8	**8**	4	12	4	0	4	-	-	-	-	-	-	-	-	-	-	-	-	6	2	8
8:00 PM	2	3	5	2	1	3	3	3	6	-	-	-	-	-	-	-	-	-	-	-	-	2	2	5
9:00 PM	2	1	3	0	0	0	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	1	0	2
10:00 PM	0	0	0	1	0	1	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
11:00 PM	1	0	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Total	48	29	77	87	88	175	84	86	170	-	-	-	-	-	-	-	-	-	-	-	-	86	88	174
Percent	62%	38%	-	50%	50%	-	49%	51%	-	-	-	-	-	-	-	-	-	-	-	-	-	49%	51%	-
AM Peak	-	-	-	09:00	11:00	11:00	09:00	07:00	07:00	-	-	-	-	-	-	-	-	-	-	-	-	09:00	07:00	07:00
Vol.	-	-	-	7	10	15	7	10	16	-	-	-	-	-	-	-	-	-	-	-	-	7	9	14
PM Peak	16:00	16:00	16:00	15:00	12:00	12:00	16:00	12:00	16:00	-	-	-	-	-	-	-	-	-	-	-	-	16:00	12:00	16:00
Vol.	11	9	20	8	9	14	12	9	16	-	-	-	-	-	-	-	-	-	-	-	-	10	9	16

1. Mid-week average includes data between Tuesday and Thursday.

Project Manager: (415) 310-6469
project.manager.ca@idaxdata.com

Location: Moonglow Rd, West of N King Rd
Date Range: 10/12/2021 - 10/18/2021
Site Code: 02

	Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Mid-Week Average		
	10/12/2021			10/13/2021			10/14/2021			10/15/2021			10/16/2021			10/17/2021			10/18/2021					
Time	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	-	-	-	0	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
1:00 AM	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2:00 AM	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
3:00 AM	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
4:00 AM	-	-	-	2	0	2	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2
5:00 AM	-	-	-	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
6:00 AM	-	-	-	4	2	6	4	2	6	-	-	-	-	-	-	-	-	-	-	-	-	4	2	6
7:00 AM	-	-	-	**9**	1	10	**6**	1	**7**	-	-	-	-	-	-	-	-	-	-	-	-	**8**	1	9
8:00 AM	-	-	-	8	5	**13**	5	1	6	-	-	-	-	-	-	-	-	-	-	-	-	7	3	**10**
9:00 AM	-	-	-	6	2	8	4	2	6	-	-	-	-	-	-	-	-	-	-	-	-	5	2	7
10:00 AM	-	-	-	3	**6**	9	3	**3**	6	-	-	-	-	-	-	-	-	-	-	-	-	3	**5**	8
11:00 AM	-	-	-	8	3	11	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	5	2	7
12:00 PM	-	-	-	5	3	8	4	5	9	-	-	-	-	-	-	-	-	-	-	-	-	5	4	9
1:00 PM	-	-	-	5	4	**9**	**6**	3	9	-	-	-	-	-	-	-	-	-	-	-	-	**6**	4	9
2:00 PM	0	0	0	2	6	8	3	**6**	9	-	-	-	-	-	-	-	-	-	-	-	-	2	4	6
3:00 PM	4	7	11	1	**7**	8	5	3	8	-	-	-	-	-	-	-	-	-	-	-	-	3	**6**	9
4:00 PM	2	**8**	10	**6**	3	**9**	2	3	5	-	-	-	-	-	-	-	-	-	-	-	-	3	5	8
5:00 PM	**6**	7	**13**	2	4	6	**6**	5	**11**	-	-	-	-	-	-	-	-	-	-	-	-	5	5	**10**
6:00 PM	1	2	3	2	5	7	0	4	4	-	-	-	-	-	-	-	-	-	-	-	-	1	4	5
7:00 PM	2	4	6	1	3	4	4	5	9	-	-	-	-	-	-	-	-	-	-	-	-	2	4	6
8:00 PM	1	2	3	0	4	4	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	0	3	3
9:00 PM	0	0	0	0	0	0	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
10:00 PM	0	1	1	1	1	2	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	0	1	2
11:00 PM	0	0	0	0	2	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
Total	16	31	47	65	62	127	56	50	106	-	-	-	-	-	-	-	-	-	-	-	-	60	55	115
Percent	34%	66%	-	51%	49%	-	53%	47%	-	-	-	-	-	-	-	-	-	-	-	-	-	52%	48%	-
AM Peak	-	-	-	07:00	10:00	08:00	07:00	10:00	07:00	-	-	-	-	-	-	-	-	-	-	-	-	07:00	10:00	08:00
Vol.	-	-	-	9	6	13	6	3	7	-	-	-	-	-	-	-	-	-	-	-	-	8	5	10
PM Peak	17:00	16:00	17:00	16:00	15:00	13:00	13:00	14:00	17:00	-	-	-	-	-	-	-	-	-	-	-	-	13:00	15:00	17:00
Vol.	6	8	13	6	7	9	6	6	11	-	-	-	-	-	-	-	-	-	-	-	-	6	6	10

1. Mid-week average includes data between Tuesday and Thursday.

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